EFFECTIVENESS OF MODIFIED ABCD BUNDLE ON ICU PSYCHOSIS AMONG CARDIAC POST-OPERATIVE PATIENTS AT A SELECTED HOSPITAL SETTING IN CHENNAI

Dissertation submitted to

THE TAMIL NADU Dr.M.G.R.MEDICAL UNIVERSITY

CHENNAI

In partial fulfilment of requirement for the degree of

MASTER OF SCIENCE IN NURSING

OCTOBER 2017

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LIST OF ABBREVIATIONS

ABCDE Bundle	-	Awakening, Breathing and Co-ordination Delirium Monitoring and Exercises
Modified ABCD Bundle	-	Awakening, Breathing, Cognitive stimulating activities and Daily exercises
AHA	-	American Heart Association
AICU	-	Adult Intensive Care Unit
AVR	-	Aortic Valve Replacement
CABG	-	Coronary Artery Bypass Graft
CAD	-	Coronary Artery Disease
CAM	-	Confusion Assessment Method
CVD	-	Cardio Vascular Disease
DSM	-	Diagnostic and Statistical Manual of Mental disorders
GCS	-	Glasgow Coma Scale
ICDSC	-	Intensive Care Delirium Screening Checklist
ICD	-	International Classification of Disease
ICU	-	Intensive Care Units
MI	-	Myocardial Infarction
MMM	-	Madras Medical Mission
MVR	-	Mitral Valve Replacement
OT	-	Operation Theatre
POD	-	Post-Operative Day
PTSD	-	Post -Traumatic Stress Disorder
ROM	-	Range Of Motion
SD	-	Standard Deviation
USA	-	United states of America
WHO	-	World Health Organization

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ABSTRACT

ABSTRACT

A study to assess the effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients at a selected hospital setting in Chennai.

OBJECTIVES

1. To assess the post-test level of ICU psychosis among the cardiac post-operative patients in the experimental and control group.
2. To assess the effectiveness of modified ABCD bundle on level of ICU psychosis among cardiac post-operative patients in the experimental and control group.
3. To associate the post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

METHODOLOGY

The research design used in this study was true experimental post-test only design with 60 sample using simple random sampling technique, with 30 each in the experimental and control group.

The informed consent was obtained after collecting the demographic data. The patients in the experimental group were administered the modified ABCD bundle. Awakening aspect of orientation was given to the patients during the pre-operative day, whereas the other components were given during the post-operative period. The patients in the control group were administered with hospital routine care.

The post-test level of ICU psychosis was assessed using the Intensive care delirium screening checklist. The post-test I was conducted on the 3rd POD and the post-test II was conducted on the 4th POD. Both the post-test levels of ICU psychosis were measured using ICDSC. The data were coded and entered in the main coding sheet.

RESULTS

The post-test I level of ICU psychosis in the experimental group had a mean score of 1.20 with SD of 1.09. Whereas the control group had the mean score of 3.23 with SD of 1.67. With regard to the post-test II level of ICU psychosis, the mean score

was 0.63 with SD of 0.81 in the experimental group and in the control group the mean score was 3.06 with SD of 1.74.

The student's unpaired 't' test revealed that there is high statistical significance between the experimental group and control group in post-test I (**t = 5.565 at p<0.001)** which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis among the cardiac post-operative patients.

There is a high statistical significance between the experimental group and control group in post-test II level of ICU psychosis using the student's unpaired 't' test which **(t = 6.944 at p<0.001)** proved that modified ABCD bundle had sustained significant impact on the level of ICU psychosis among the cardiac post-operative patients.

The paired 't' test revealed that there is high level of statistical significance between the post-test I and post-test II level of ICU psychosis in the experimental group with **t= 2.984** which was found to be higher than the table value **at p<0.001**.

The study findings revealed that modified ABCD bundle had immediate and sustained effect on reducing the level of ICU psychosis among the cardiac post-operative patients.

The findings also revealed that a statistically significant association was found between the post-test I level of ICU psychosis among experimental group with regard to gender **(χ^2=7.933 at p<0.05)** and marital status **(χ^2=32.160 at p<0.001),**the post-test I level of ICU psychosis among control group and occupation (χ^2 **=25.460 at p<0.05).** The findings indicated that the samples in male gender married population and skilled workers were having sub-syndromal delirium.

CONCLUSION

The findings verified that modified ABCD bundle was very effective in reducing the level of ICU psychosis of patients who underwent cardiac surgery and can be used as a non-pharmacological measure to reduce ICU psychosis during ICU stay.

INTRODUCTION

CHAPTER – 1

INTRODUCTION

In a disordered mind, as in disordered body, soundness of health is impossible

- Cicero

1.1 BACKGROUND OF THE STUDY

Environment is the gift of nature given by God, from the birth till death human beings constantly interact with the environment they live. Because of the permanent interaction between man and his environment, our health is to a considerable extent determined by the environmental quality. **According to WHO,** "Health is a state of complete physical, mental, social and spiritual well-being and not merely the absence of disease or infirmity".

The health illness spectrum emphasizes that health of an individual is not static. It is a dynamic phenomenon, continuous changes occur from positive health to illness and death. Physiological, psychological and environmental factors impinge on the individual's health that leads to illness **(Berman A, 2008).**

Cardiovascular diseases have evolved substantially in the last few decades. It is becoming an increasingly common disease worldwide. Mortality due to cardiovascular diseases are increasing such as ischaemic heart disease. Cardiac diseases include those of the rheumatic, hypertensive, ischemic and cardiovascular diseases. In India the prevalence rate of coronary artery disease was found to be 65.4 per 1000 males and 47.8 per 1000 females respectively **(WHO, 2016).** The peak age was attained between 50 – 60 years and males were affected more than females. Disparity among gender regarding cardiovascular diseases, its risk factors, morbidity and mortality are gradually decreasing. Women traditionally had a low risk, but recent epidemiological studies indicate an increasing pattern of mortality and morbidity with regard to cardiovascular disease in all parts of India **(S.Dinkar, 2010).**

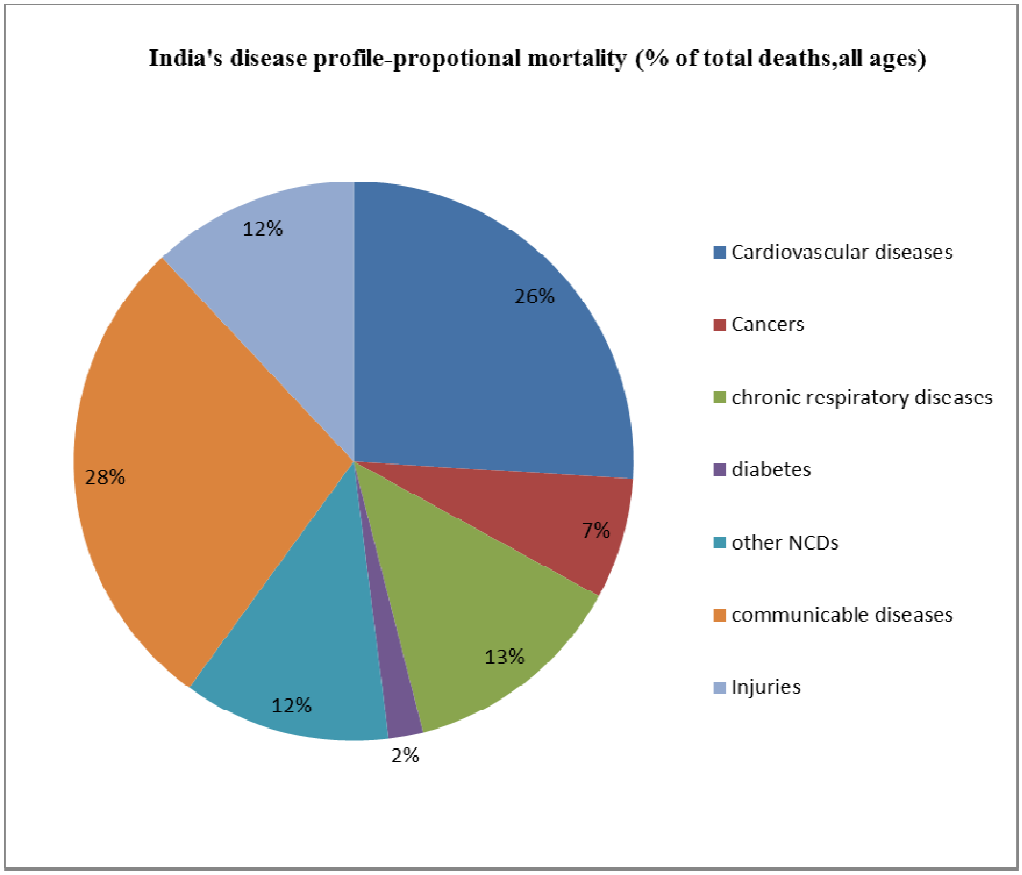

Fig 1.1: Percentage distribution of WHO's non-communicable diseases proportional mortality

Source: WHO non-communicable diseases country profiles 2014.

According to WHO, non-communicable diseases' country profiles records by 2014 denotes that non communicable diseases contribute to 53% of total deaths in India. Cardiovascular diseases contribute 26% of the total non-communicable diseases mortality. Every year about 4 Indians die of heart ailment every minute. The rate of heart diseases in India has doubled over the past 20 years.

Shradha Chauhan (2013) conducted a meta-analysis on the prevalence of cardiovascular diseases in India, the study result revealed that the states of Rajasthan, Jammu and Kashmir and Uttar Pradesh reported are 6 – 10% in rural areas. Rajasthan shows the lowest prevalence in rural area at 3 – 5% along with Himachal Pradesh and Punjab.

In the southern states of India, in Tamil Nadu, the prevalence was found to be 5.1%.Urbanized regions in Kerala and Maharashtra reported a very high prevalence rate ranging from 500/1,00,000 for men and 250/1,00,000 for women. The rates were almost twice that of United States of America (USA) **(Soman C R, 2011).**

In developed countries cardiovascular disease and stroke are the first and second leading causes of death with an estimated 7.4 million and 6.7 million respectively. Among all cardiovascular disorders, coronary artery disease or ischemic heart disease is on the rise by 12,00,000 per year, 1,00,000 per month, 23,076 per week, 3,287 per day, 136 per hour, 2 per minute in the USA according to the **American Heart Association (2006).**

The World Health Organization (2016) reported that 17.5 million people die each year from cardiovascular diseases and this value is estimated to reach 23 million by 2030, an estimated 31% of all deaths worldwide. More than 75% of the deaths due to cardiovascular diseases occur in low and middle-income countries. It is proven that 80% of the deaths are through either myocardial infarction or stroke.

Probably no other achievement found the public's attention on the world of cardiac surgery. Surgery of the heart has probably reached the limits set by nature to all surgery, no new method, and no new discovery can overcome the natural difficulties that attend a wound of the heart **(Sir Stephen Paget, 1896**). These statements were obstacles to open chest surgery during that era.

The first successful heart surgery was done by Dr.Daniel Williams for a stab wound to the heart in 1893. Until 1953, cardiac surgery was in its infancy. The first successful open heart surgery was performed with the use of a heart lung machine in 1953 on May 6th by Dr. Gibbon. This year marks the 64th year of the successful completion of the 1st successful heart surgery.

In the year 1967 December 3rd the first human heart transplantation was performed by Dr.Christian Bernard. This event not only hailed as a technological miracle but also had a profound emotional impact. The history of cardiac surgery is the result of many investigations that paved way for momentous achievements. Cardiac surgery

presents a life saving and life enhancing opportunity to hundreds and thousands of patients.

AHA (2015) based on National Center for Health Statistics Annual Data, published that there is a sudden increase in the current usage of cardiovascular surgical and invasive procedures. The total number of inpatient underwent cardiovascular operations and procedures from 1996-2006, have increased to 33%.

Cardiovascular surgery is surgery on the heart or great vessels performed by cardiac surgeons. It is done to treat complications of ischemic heart disease, correct congenital heart disease, or treat valvular heart disease from various causes including endocarditis, rheumatic heart disease and atherosclerosis. Globally 8% of the world population have access to coronary artery bypass graft surgery, and 6.5 lakhs surgeries were done in the year 2007. Out of 6.5 lakhs, 4.5 lakhs were performed in the US alone, 2 lakhs were performed in the rest of the world **(Devishetty, 2010).**

Some of the common cardiovascular surgeries are coronary artery bypass graft, valve replacement surgeries, atrial septal defect and ventricular septal defect, closure and heart transplant. Over the last 50 years India has made remarkable advances in the field of cardiac treatment, but this has not decreased the number of heart patients. Cardiac surgery is on the rise globally, whether through disease, congenital defects or generalized degradation of cardiac function. Over time the cardiovascular diseases are increasing vividly, substantiating the need for continued growth of cardiovascular surgery. In the year 2010, there were about 30,000 bypass surgeries done in the United Kingdom. An estimated 6.2 million in-patient cardiovascular operations and procedures were performed in the United Kingdom. According to American Heart Association in the United States each year 694,000 open heart procedures were carried out. This includes 104,000 valve replacement surgeries, 2,210 heart transplants and 4,48,000 CABG surgeries among which 323,000 were men and 1,25,000 were women **(J.Ryan Jordan, 2010).**

Many patients face significant challenges during the post-operative period including pain, anxiety and sleep disturbances which can lead into ICU psychosis.ICU psychosis is a transient, usually reversible cause of cerebral dysfunction and manifestation of cognitive deficits in arousal with clinically wide range of neuropsychiatric abnormalities **(Heymann A, 2010).**

Psychosis is an organic or functional mental illness which includes gross disorder of perceptions or thought form which causes loss of cognitive function with external reality. **According to American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM),** ICU psychosis is a disturbance of cognition and consciousness that develops over a short duration of time and fluctuates over time. The different terms used to describe ICU psychosis are, delirium, ICU syndrome, acute brain failure and acute confusional state **(Girard DT, 2008).**

ICU psychosis involves qualitative as well as quantitative alterations in consciousness with diminished orientation to the present environment.ICU psychosis is an understudied complex neuropsychiatric syndrome, developing in 11%-42% of general medical patients **(Siddiqi, 2006)** and ICU psychosis is occurring up to 50% of hospitalized elderly patients **(Cole, 2004**). Historically, management of ICU psychosis focuses on underlying causes but the increasing attention to advanced age related problem, has heightened awareness that ICU psychosis rather than being in a benign transient stage, is often persist with an independent impact on the patient's functional capacity, mortality and morbidity **(Pitkala, 2005**).

ICU psychosis is a disorder which develops during stay in the intensive care unit, experiences hallucinations, sleep deprivation, anxiety, severely disassociated and agitated. Underlying causes of ICU psychosis such as sleep disturbances, sensory deprivation, sensory overload, anxiety, immobilization, pain and unfamiliar environment. This can be prevented by early assessment, diagnosis and treatment. This may prevent the patient to go into the state of ICU psychosis thereby it prevents morbidity, mortality and health care cost. ICU psychosis has been well known since 1960s, but recently a noticeable increase in ICU psychosis during post-operative period due to effect of strong anesthetic drugs and cardio pulmonary bypass machine.

ICU psychosis has a substantial impact on post-operative healthcare specially in cardiac patients. It is associated with the ICU setup, ICU policies, physical impacts, psychological impact and financial impacts. The highest prevalence of ICU psychosis is 87% in critically ill patients. The intervention for ICU psychosis requires careful consideration, pharmacological intervention and non-drug strategies.

Early identification, prevention of ICU psychosis and treatment was essential for effective post-operative outcome. **According to American Association of critical care Nurses (2015)** most of the post-operative cardiac patients experience ICU psychosis as they undergo mental stress, pain, use of cardiopulmonary bypass machine, on ventilator and other treatment. Post-operative cardiac patients experience disturbance of consciousness, sleep disturbances, anxiety and agitation. But often the first indication for ICU psychosis is cognitive impairment. However ICU psychosis symptoms warrant careful attention.

ICU psychosis is widely prevalent during critical care, illness and places the patient at greater risk for development of cognitive impairment and increased mortality **(Jackson JC, 2004).**

In India, a prevalence study conducted at Vellore on 53 patients admitted to medical intensive care unit was screened using Intensive care delirium screening checklist and International classification of diseases diagnostic criteria, resulted in 75% and 74% respectively of the patient is in ICU psychosis **(Shyamsundar G, 2009).**

The nurse – patient relationship is one of the keystone in preventing ICU psychosis. Supportive approach by the health care team may be quite helpful in patient's rehabilitation. Post-operative care in nursing offers a wide opportunity in the use of assessment skills and advanced technology for both physical as well as psychological aspect of patient care. It provides opportunity to work in collaboration with other disciplines to improve the patient outcome and minimizes the length of stay in hospitals. In the post-operative care unit, nurses must have excellent assessment skills, communication skills, provide exercises and compassionate care to reduce the psychological stress after cardiac surgery.

Arend E (2009) conducted a systematic review in United Kingdom on the current discourse in relation to intensive care unit on pre-disposing and contributory factors associated with ICU psychosis development among ICU patients. The study revealed that nurses are highly efficient health care personnel to detect manage and even prevent ICU psychosis.

Roberts B (2004) stated that nurses are the one who recognizes the need for personal assistance via psychiatric consultations or for more intensive observation and management of patients with ICU psychosis to ensure holistic and quality of care through meaningful conversation and empathetic touch. So, detailed history from nursing staff is particularly important to help in early detection and co-ordination with other members of the health care team, to initiate actions in care and treatment of patients with ICU psychosis.

Studies have emphasized on use of introductory in-services and educational intervention and implementation of tools for evaluation of ICU psychosis to improve quality of care for ICU Patients **(Forsgen LM, 2010).**

1.2 SIGNIFICANCE OF THE STUDY

Disease is an abnormal process that affects all aspects of the human life. The hospital environment and particularly the intensive care unit causes stress in the patients and in their family. In the recent years there has been increasing awareness of the fact, diseases, treatment and events such as surgery or the experience of intensive care often have significant and persistent consequences for the cognitive and psychological functioning. Cardiac post-operative patients often report that they experience psychological distress, including anxiety and fear after the cardiac surgery.

Advances in medical science and technology have prompted the establishment of many highly specialized units providing intensive patient care. As the number of patients increasing in intensive care units, ICU psychosis is perforce increasing as a problem that has recently attracted much attention. The management of ICU psychosis is of high priority for nursing care as it affects the quality of life. There are various non-pharmacological therapies like awakening, breathing exercises, cognitive stimulating activities, daily exercises and relaxation therapy for ICU psychosis.

Raja Jayaram (2008) published an article on the cost of intensive care in India which estimated that there are about 70,000 ICU beds available that includes all types, and across all hospitals and small time nursing homes in India that cater to five million patients requiring ICU admission every year. India currently spends Rs. 1,03,000crores on healthcare, which is projected to grow to Rs 2,83,000 crores by 2012. Government and international agencies will only be able to spend Rs 30,000 crores over the next 10 years on healthcare infra-structure. Therefore almost 80 per cent of investment will have to come from the non-profit private and charitable sector where critical care accounts for 20 to 30 per cent of a hospital's budget.

Usha Lee McFarling (2016) published an article which reported that 80 % of ICU patients suffer from ICU psychosis during their hospital stay. One quarter of all ICU patients suffer from post-traumatic stress disorder once they leave ICU. Patients with ICU psychosis are less likely to survive and more likely to suffer long term cognitive damage.

Girard D Timothy (2010) published an article on delirium in the intensive care unit, stated that delirium is an acute and fluctuating disturbance of consciousness and cognition which is a common manifestation of acute brain dysfunction in critically ill patients. It occurs in up to 80% of the sickest intensive care unit patients. Although dysfunction of other organ systems continues to receive more clinical attention, delirium is now recognized to be a significant contributor to morbidity and mortality in the ICU. It is recommended that all ICU patients be monitored using a validated delirium assessment instrument. Patients with delirium have longer hospital stays and lesser 6-months survival than do patients without delirium. Preliminary research suggests that delirium may be associated with cognitive impairment that persists months to years after discharge. Only little evidence exists regarding the prevention and treatment of delirium in the ICU, but multi-component interventions reduce the incidence of delirium in non-ICU studies. Strategies for the prevention and treatment of ICU delirium are the subjects of multiple on-going investigations.

Sudhamaniamma S (2001) published an article on ICU psychosis nurses challenges in India, which believes that the appearance of a special environment, flashing light, buzzing machines, painful procedures, crowded and hyperactive environment

induce immense stress on the patient. The explosion of computerized automated monitoring system that provides minute to minute data on multiple physiologic responses has created a physical barrier, preventing meaningful nurse-patient contact. Bombardment with continuous high level stressors can be devastating both physically and psychologically to a critically ill patient. Patients have difficulty in coping with the crisis as derangement of emotion, cognition, and behavior may require prompt attention. Since all these factors cannot be removed, it is paramount to screen the patient for prevention as well as to provide appropriate treatment.

Girard D T et al (2008) published an article on delirium in intensive care unit, stated that the prevalence of delirium reported in Medical and Surgical ICU, Cohort studies range from 20% to 80%, depending upon severity of illness observed and diagnostic methods used. Despite high prevalence rates in the ICU, delirium often goes unrecognized by clinicians or its symptoms are incorrectly attributed to dementia, depression or ICU syndrome.

It is estimated that one patient in every three who spends more than 5days in ICU, experiences ICU psychosis. As the number of patients increase in the ICU, the disorders will correspondingly increase. Patients have serious adverse effects on mortality, functional outcomes, length of hospital stay and institutionalization. Twenty to twenty five percent of medically ill hospital in-patients experience ICU psychosis **(Allan H Rooper, 2005).**

Bhogale GS et al (2011) conducted a cross-sectional observational study to estimate the prevalence and nature of co-morbid psychiatric illness in the cases referred from ICUs at KLES hospital in India. The study included all the patients referred from different ICUs to psychiatry department for consultation during the four-year period from 1st January 2000 to 31st December 2003. Assessment was done by psychiatrist and diagnosis was made by using ICD-10. Sample size consisted of 15,659 (2.99%) patients who were admitted in different intensive care units. Descriptive statistical analysis was done. The study result showed that there were 309 (1.97%) referrals from intensive care units to psychiatry department during the period of the study.

The diagnosis of ICU psychosis is clinical and no laboratory tests can diagnose ICU psychosis. Observation is essential because patients are often confused and delirious and unable to provide information.

The Dutch guidelines on ICU psychosis in the intensive care recommends the screening of all ICU patients with a reliable and validated delirium screening instrument such as the intensive care delirium screening checklist (ICDSC) or the confusion assessment method-ICU **(Boogaard M, 2009).**

Lundstrom, (2005) conducted a study and found that the interventions that encouraging individualized care and enhanced interactions, reduced the duration of ICU psychosis and mortality.

Post-operative care nurses have contact with patients over the 24hour cycle and able to communicate with the family members also. Quick assessment skills, changes in the vital parameters are first identified by the staff nurses. Without specific training nurses are not able to identify ICU psychosis with standard instruments, because they tend to be reliant on orientation as a measure of cognition or mistake compliant behaviour as evidence of intact cognition **(Inouge, 2001**).

Health care costs are typically doubled in ICU psychosis patients **(Fick, 2005**), due to prolonged hospitalization. Documentation of cognition as a 5^{th} vital sign in alteration-in- cognition is a trigger assessment of possible ICU psychosis. Cognitive impairment is the indication of ICU psychosis. Frequent cognitive assessment in post-operative cardiac intensive care unit is high visibility for developing ICU psychosis.

Multi-component intervention package including orientation, breathing exercises, cognitive stimulating activities, daily exercises, hydration, nutrition, eliminating unnecessary medications, pain relief measures, sleep enhancement, correction of sensory deficit and early mobilization can reduce the severity and frequency of ICU psychosis with absolute risk reduction of 13%-19% **(Cole, 2004**). For ICU psychosis pharmacological prophylaxis in high risk patients using donepezil (**Sampson et al, 2006)**, and haloperidol **(Kalisvaart et al, 2005**) can reduce the severity and duration of ICU psychosis.

According to **Kaplan and Saddocks** in diagnostic and statistical manual of mental disorders (DSM- 4-TR), the psychiatric presentation of a medical illness is classified as the presence of mental symptoms that are judged to be direct consequences of a general medical condition. Therefore understanding common mental symptoms and medical diseases that may cause or mimic them is of atmost importance.ICU psychosis is a common cause for psychotic symptoms like thought disorders, agitation, violent behaviours and due to severity of illness, frequent use of sedation and analgesia, lack of verbal communication. It may be difficult to assess ICU psychosis in critically ill patients.

Finotto S A (2006) conducted a randomized study on nursing interventions for the prevention of the delirium in intensive care unit. The study was conducted on 48 intensive care patients in Italy, The study concluded that the nurse activities have an important role to assess, diminish and slow down the increase of ICU psychosis.

Mark Van Den Boogard et al (2009) conducted a study to know regular and systemic assessment of ICU psychosis by ICU nurses and knowledge of ICU psychosis was assessed. The study revealed that more than 60% of the patients with ICU psychosis are missed by staff nurses and more than 70% by physicians.

Many of the risk factors for ICU psychosis can be modified by using ABCD bundle interventions. Many reviews showed mostly post-operative cardiac patients experience more ICU psychosis but episodes of ICU psychosis are often missed in the post-operative care practices. Thus the most common problem faced by the critically ill patients in the ICU setting is ICU psychosis and it remains an unrecognized symptom. The above facts, review of literature and clinical experience, motivate the student researcher to conduct this study. By assessing the prevalence and providing information booklet on ABCD bundle for the nurses regarding management of ICU psychosis, there may be a wave of change in one's mind that can decrease the mortality, morbidity and length of hospital stay among ICU patients.

At **Madras Medical Mission** hospital, every day 5-8 patients undergo cardiac surgeries, the recent research study conducted (2016) found that 39% of the patients at ICU are having ICU psychosis and 40% are at risk of developing ICU psychosis. In the

work experience of the investigator, it is observed that the nursing personnel in ICU, lack knowledge regarding ICU psychosis and its management and nurses are not provided with any special training regarding ICU psychosis. This has motivated the investigator to choose this topic for the study.

1.3 STATEMENT OF THE PROBLEM

A study to assess the effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients at a selected hospital setting in Chennai.

1.4 OBJECTIVES

1. To assess the post-test level of ICU psychosis among the cardiac post-operative patients in the experimental and control group.
2. To assess the effectiveness of modified ABCD bundle on level of ICU psychosis among the cardiac post-operative patients in the experimental and control group.
3. To associate the post-test level of ICU psychosis among the cardiac post-operative patients with their selected demographic variables of experimental and control group.

1.5 OPERATIONAL DEFINITION

1.5.1 Effectiveness

It refers to the impact of modified ABCD bundle in prevention of development of ICU psychosis among cardiac post-operative patients which is assessed by using Intensive Care Delirium Screening Checklist (ICDSC).

1.5.2 Modified ABCD Bundle Intervention

Modified ABCD bundle is a group of intervention which is given to every cardiac post-operative patient. Modified ABCD bundle consist of a group of interventions like awakening, breathing exercises, cognitive stimulating activities and daily exercises which is designed by the investigator to administer from the pre-operative period till 4 days of post-operative period for preventing the development of ICU psychosis.

1.5.3 ICU Psychosis

It refers to an acute organic brain syndrome involving impaired intellectual functions which refers to transient psychotic episodes such as delirium, restlessness,

clouding of consciousness delusions, extreme excitement, paranoia and hallucination occurring in cardiac post-operative patients getting treatment in an intensive care unit.

1.5.4 Cardiac post-operative patients

It refers to the post-operative patients who had undergone cardiac surgeries like coronary artery bypass graft-on pump, coronary artery bypass graft-off pump, valve replacement or valve repair surgeries.

1.6 HYPOTHESES

NH_1: There is no significant difference in the post-test level of ICU psychosis among cardiac post-operative patients in the experimental and control group.

NH_2: There is no significant association of post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

1.7 ASSUMPTIONS

1. Cardiac post-operative patients are at risk of developing ICU psychosis.
2. Cardiac post-operative patients need additional interventions for the prevention of ICU psychosis.
3. Modified ABCD bundle are potential solution for preventing ICU psychosis.

1.8 DELIMITATIONS

The study was delimited to a period of 1 month of data collection.

1.9 CONCEPTUAL FRAMEWORK

1.9.1 GENERAL CONCEPTS OF WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY:

According to Wiedenbach, nursing is nurturing and caring for someone in a motherly fashion. Nursing is a helping service that is rendered with compassion, strong understanding for those in need of care, counsel and confidence in the area of health.

Perspective theory postulates that the nurse performs goal directed actions. The theory consists of three factors.

1) Central purpose

2) Prescription

3) Realities in immediate situation

The nurse develops prescription based on the central purpose and implements in accordance to the realities of the situation.

1) **Central purpose:** The quality of health nurse desires to sustain in her patient and specifies what she recognizes to be her special responsibilities in caring for the patient.
2) **Prescription:** Nature of action that will most likely lead to fulfillment of nurse's central purpose.
3) **Realities:** Factors influencing the fulfillment of central purposes**.** Wiedenbach defines five realities namely. Wiedenbach defines five realities namely
   a) **Agent:** Is a practicing nurse who engages in innumerable acts.
   b) **Recipient:** Patient who has personal attributes problems, capabilities, aspiration and abilities to cope.
   c) **Goal:** Desired outcome nurse wishes to achieve for her patient.
   d) **Means:** Activities and devices through which practitioner is enabled to attend her goal.
   e) **Framework:** Context with in which nursing goal is practiced.

According to Wiedenbach, nursing practice consists of:

1. **Identifying the patients need for help**
2. **Ministering the needed help**
3. **Validating the need for help**

1. Identifying the patients need for help:

Identification involves viewing the patient as an individual with unique experiences and understanding the patient's perception of the condition. The nurse determines the patients need for help based on the existence of the need, whether the patient realizes the need, what prevents the patient from meeting the need and whether patient can meet the need alone.

2. Ministering the needed help:

Ministration refers to provision of needed help. The nurse formulates a plan for meeting the patients need for help based on the available resources. What the patient thinks, knows, can do and has done plus what the nurse thinks, knows, can do and has done. The nurse presents the plan to the patient and the patient responds to it.

3. Validating the need for help:

Validation refers to a collection of evidence that shows the patient needs has been meet and his functional ability has been restored as a direct result of nurses action.

1.9.2 APPLICATION OF MODIFIED WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY FOR THE PRESENT STUDY:

Perspective theory for nursing is described as concerning a desired situation and ways to attain it. Theory directs action towards an explicit goal.

Nursing practice consists of :

1. **Identifying the patients need for help**
2. **Ministering the needed help**
3. **Validating that the need for help**

STEP 1- IDENTIFYING THE NEED FOR HELP

In identifying the need, the nurse perceives the patient as consistent or inconsistent, collect the information and identify the need for help. There are two components in identifying the need for help.

a) General information

This comprises of collecting the information to identify the need.In this study the investigator assessed the general information which included the demographic variables such as age, gender, education, occupation, monthly income and marital status.

b) The central purpose

Central purpose refers to what the nurse wants to accomplish. In this study the investigator identified the central purpose was to reduce the level of ICU psychosis during the ICU stay among post-operative cardiothoracic patients.

STEP 2 – MINISTERING THE NEED FOR HELP

In ministering the needed help to the patients, the nurse may give advice or orientation before surgery,breathing exercises,cognitive activities and apply a comfort measure or carry out ICU stay comfortable .

There are two components in identifying the need for help.

a) Prescription

It refers to plan of care, the nature of action that will fulfill the central purpose. In this study the investigator adopted the effectivenessof modified ABCD bundle in reduction of ICU psychosis.

b) Ministering (Intervention)

The nurse implements the practitioner directed interventions by application of modified ABCD bundle during the post-operative period along with the hospital routine for the experimental group under the existing realities.

c) Realities

Realities refer to the physical, emotional and spiritual factors that come into play in a situation. In this study it refers to the patient's adaptation to ICU set up.

d) Agent

The agent is the participating nurse or a designer who has the personal attributes, capabilities, commitment and competence to provide nursing care. In this study the agent is the researcher.

The Recipient

In this study the recipient are the patients who underwent cardiac surgery.

The Goal

The goal is the nurses desired outcome, it directs action and suggests the reason for taking those actions. In this study the goal was to reduce ICU psychosis during post-operative period.

The Means

The means are the activities and devices used by the nurse to achieve the goal. In this study the means was modified ABCD bundle.

The Framework

Framework refers to the facilities in which nursing is practiced, it comprises of human, environmental, professional and organizational aspects of care. In this study the framework refers to the patients in cardiac post operative ICU at MMM hospital.

STEP 3 – VALIDATING THE NEEDED HELP WAS MET

It is validating the needed help was delivered in achieving the central purpose. This step involves the post assessment after ministering the help and comparison to infer the outcome. This approach thereby enable the researcher to make suitable decision and recommended action to continue, drop or modify the nursing action. Here it is the effectiveness of modified ABCD bundle on the level of ICU psychosis among cardiac post-operative patients during ICU stay using ICDSC scale.

Reassessment – If there was no reduction in the level of ICU psychosis after modified ABCD bundle intervention, the investigator recommends reassessment.

Enhancement – If there was reduction in the level of ICU psychosis after modified ABCD bundle intervention, enhancement of the intervention will be carried out.

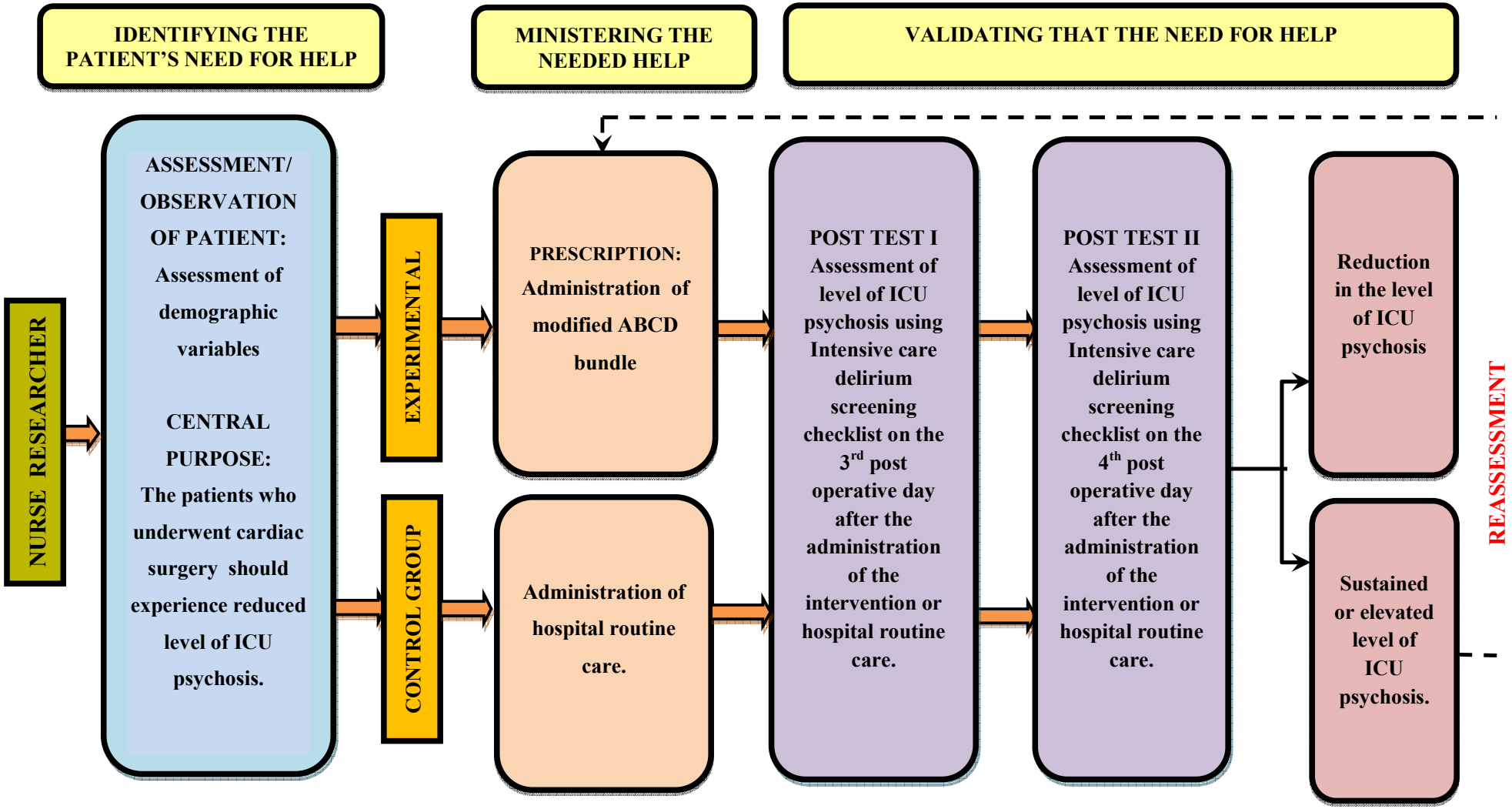

Fig.1.2: Conceptual framework based on Modified Wiedenbach's Helping Art Theory

REVIEW OF LITERATURE

CHAPTER – 2

REVIEW OF LITERATURE

Review of literature is a systematic search of published work to gain information about a research topic. Through the literature review, researcher generates a view about what is known about a particular situation and lays a foundation for the research plan. It provides a background for the current knowledge on the topic and illuminates the significance of the study. The present literature review was based on extensive surveys of journals, books and international nursing studies, a review of literature relevant to the study undertaken which helped the investigator to develop deep insight into the problem.

The logical sequence of the chapter is organized in the following sections:

Part 2.1: Reviews related to ICU psychosis in general.
Part 2.2: Reviews related to prevalence of ICU psychosis among cardiac patients.
Part 2.3: Reviews related to ABCDE bundle and other interventions for ICU psychosis.

2.1 Reviews related to ICU psychosis in general.

Elizabeth C. Parson et al [2015] conducted a study on association of insomnia with quality of life impairment among medical surgical intensive care unit survivors. The purpose of the study was to examine the prevalence of insomnia and its relationship to health related quality of life in post intensive care unit. This cross sectional study examined data from 120 patients who had an ICU stay more than 24 hours. Pre-hospital health was assessed in hospital. 28% of subjects met insomnia criteria in the pre-hospital period. 12 months after post ICU period6, insomnia was independently associated with mental health related quality of life they are prone to develop ICU psychosis. The study concluded that, insomnia was common among ICU survivors. There was a significant association between post ICU insomnia and mental health related quality of life. The studies revealed that most of the patients with insomnia were developed ICU psychosis. They were also able to identify ICU survivors who would have benefited from further psychiatric evaluation.

Marino [2015] conducted a study on implementation of ICU psychosis protocol through an interdisciplinary quality improvement project. The main purpose was to develop an educational program for prevention and management of ICU psychosis in ICU patients. A sample of 49 nurses participated and it was measured using 5-point likert scale. The findings revealed that there was a significant increase in overall positive perception regarding management of ICU psychosis. The daily ICU psychosis screening was initiated regardless of clinical ICU psychosis scopes. The study concluded that the nurses had increased awareness and knowledge of ICU psychosis. It also equipped them to screen and treat the patients in the intensive care unit.

Christensen M [2014] conducted an exploratory study among staff nurses regarding the knowledge of ICU psychosis in medical ICU. The purpose of the study was to assess the level of knowledge in intensive care unit among nurses regarding ICU psychosis. 53 staff nurses were selected using purposive sampling. A 5-point likert scale questionnaire was employed to determine the participant's knowledge on signs and symptoms of ICU psychosis. The findings revealed that overall positively answered score was 27 out of 40 questions. Mean score for knowledge of signs and symptoms, risk factors and negative outcomes were 15, 17, 18 respectively. The study concluded that the ICU nurses had limited knowledge regarding the signs and symptoms and risk factors of ICU psychosis.

John Christina et al [2014] conducted a randomized control trial on a study on Post-traumatic stress disorder related symptoms among relatives of patients treated in intensive care unit. The purpose was to evaluate the effectiveness of the provision of information in the form of a rehabilitation program following critical illness in reducing psychological distress in the patient's close family. The sample consisted of 104 ICU recovering patients and relatives. The selected relatives and patients received the rehabilitation program 1 week after ICU discharge. Psychological recovery of relatives was assessed by examining the rate of depression, anxiety and post-traumatic stress disorder related symptoms for 6 months after ICU discharge. No difference was shown in the rate of depression, anxiety, or PTSD related symptoms between the study groups. Study concluded that a high incidence of psychological distress was found among relatives.

Peter M C Klein et al [2014] conducted a prospective cohort study to determine the mortality due to ICU psychosis among critically ill patients. They selected 1112 intensive care unit patients from 32 mixed ICUs for a period of 3 years.ICU psychosis was evaluated by using validated protocols and also assessed the rate of mortality during the intensive care period. The result revealed that 558 patients developed one episode of ICU psychosis and crude mortality was 94 among the 558 patients. Among 1112 ICU patients 554 identified without ICU psychosis. And mortality was 40 among 554. Comparison among both the group showed that ICU psychosis was associated with mortality.

Wade D et Al [2013] surveyed the clinical and acute psychological risk factors for PTSD after critical care. This study was aimed to establish, the methodological short comings of observational studies regarding PTSD. Conducted a systematic review of observational studies with regard to quality, prevalence estimates and risk factors. The clinical risk factors identified over the two periods were the use of benzodiazepines, duration of sedation and mechanical ventilation by ICU survivors who suffered from PTSD. The study concluded that, the use of benzodiazepines, duration of sedation, fear, stress and delirium in the ICU are likely the risk factors for subsequent PTSD.

Catherine Hough L. Heaton et al [2013] conducted a longitudinal study to investigate traumatic stress and depressive symptoms over the year following medical surgical intensive care unit admission. The longitudinal investigation included 150 medical surgical ICU patients. They assessed acute stress and post intensive care PTSD symptoms with the PTSD checklist. The prevalence of substantial PTSD and psychosis symptoms were 16% and 31% at 3 months post ICU and 15% and 17% at 12 months post ICU respectively. In acute stress, symptoms may represent a modifiable risk factor for psychiatric morbidity among ICU survivors. The study concluded that early interventions for at risk ICU survivors may improve long-term psychiatric outcomes.

Tsuruta R et al [2010] conducted a study to investigate prevalence and associated factors of ICU psychosis during an ICU stay. Study was conducted on 103 of 172 patients admitted in ICU at Japan. Results showed that 20% of 103 patients and 76% of 17 mechanically ventilated patients developed ICU psychosis. The study concluded

prevalence of ICU psychosis was 20% in ICU patients and 80% in ventilated patients in a Japanese ICU.

Helle Svenningsen et al [2011] conducteda prospective follow up study to evaluate incidence of ICU psychosis among ICU patients in Denmark. The study was conducted on 139 adult patients among them 41 patients showed positive score for ICU psychosis and sedative drugs did not influence the incidence. The study revealed that ICU psychosis occurred in 40% of adult ICU patients of all ages.

Gong Z P et al [2009] conducted a study to assess medical community awareness and practice regarding ICU psychosis in Intensive care unit at Zhejiang University in China. The investigator distributed110 pre-designed questionnaires to intensive care unitcare practitioners. The study result showed that 55.3% of the clinicians considered ICU psychosis is common in Intensive Care Unit. Study concluded that ICU psychosis is still under recognized in routine intensive care practice, monitoring and treatment inIntensive Care Unit.

Sandeep Groover et al [2009] conducted a study on prevalence of patients with ICU psychosis in medical surgical setting with psychiatric referral. The rates 0.2% to 1.56% of patients were in ICU psychosis. Study revealed scarcity of data in Indian sub-continent and prevalence in the medico-surgical setting and ICU psychosis for diagnostic and psychiatric referral improves with treatment.

Pratik Pandharipande et al [2007] conducted a study to identify the prevalence of the delirium and its motoric subtypes of delirium. The study conducted among traumatic and adult surgical intensive care unit patients who required mechanical ventilator for more than 24 hours. They were prospectively evaluated for delirium by using confusion in assessment method (CAM- ICU) and Richmond Agitation stations scale. Assessed 100 intensive care unit patients 54 of them were traumatic patients and 46 of them were surgical patients and they were monitored for delirium till ICU discharge. This study revealed that prevalence of delirium for entire study population was 70%, out of which 67% traumatic patients and 73% of them were surgical patients with delirium. Evaluation of the subtypes showed that more prevalent subtype was hypoactive delirium, (64% in surgical and 60% in traumatic patients). Mixed type delirium (9% and 6%

respectively in both groups) and pure hyperactive delirium (0%and 1% respectively in both groups). Usually these subtypes of delirium may be undiagnosed and lead to many health care issues.

McAvay G J et al [2007] conducted a cohort study to determine hospitalization associated with ICU psychosis. The study conducted among 416 hospitalized patients. The result showed that 36(8.6%) developed ICU psychosis within 5 days after hospitalization. Study showed that hospitalized patients were at risk for development of ICU psychosis after hospital admission.

2.2 Reviews related to prevalence of ICU psychosis among cardiac patients.

Instenes et al [2017] conducted a qualitative study on post-operative ICU psychosis after surgical aortic valve replacement or trans catheter, aortic valve implantation among 10 octogenarian patients included 5 men and 5 women. Investigator used CAM method to assess the post-operative ICU psychosis for five days and assessed the cognitive function, after the discharge follow up done by using mini mental status examination. Followed by in-depth- interview with each patient for 6-12 months of post discharge period. The data were analysed by using phenomenological method. The study results revealed that patients had ICU psychosis state and that can persist for up to 12 months later. The findings also revealed that the patient who undergo surgical aortic valve replacement and trans-catheter aortic valve replacement, had strong and distressing memories of their ICU psychosis state.

Lee A et al [2017] conducted a systematic review on risk prediction models for ICU psychosis after cardiac surgery in the intensive care units. The investigator assessed the transportability of the risk predictor's model on a cohort study of 600 patients who underwent cardiac surgery for a period of 2 years at Hong Kong. Three high quality ICU psychosis risk prediction models with PRE-DELIRIC model were identified from published articles. The study revealed that the PRE-DELIRIC model were found good calibration and acceptable discrimination. It can be more clinically useful to predict the ICU psychosis risk in among post-operative cardiac patients.

Ogawa M et al [2017] conducted a study on pre-operative exercise capacity associated with prevalence of post-operative ICU psychosis. The investigator selected 313 patients between the age group of 14.8-68.6 years. Measured the physical function pre-operatively by using 6-min walk distance exercise and time up go test. ICU psychosis was assessed every 8 hour from the day of cardiac surgery till 5^{th} post-operative day by using ICDSC. The study result revealed that 46 patients had post-operative day ICU psychosis. The findings also revealed that 6minutes-walk test showed statistical significant indication for developing ICU psychosis.

Pauley E [2015] analyzed the medical records of cardiac intensive care unit patients, to assess the incidence and level of ICU psychosis among 670 cardiac intensive care unit patients using CAM-ICU questionnaire. The results revealed that 88% had positive ICU psychosis score which indicated the chance of ICU psychosis. 20% diagnosed with ICU psychosis. Patients diagnosed with acute renal failure, valvular disorders were more likely to be CAM-Positive.

Ralph Francis Mangusan et al [2015] conducted a retrospective study, reviewed 656 electronic medical records of cardiac surgical patients to assess the outcomes associated with post-operative ICU psychosis for post-operative cardiac patients. In this study the investigator identified prevalence of falls, length of stay after surgery, use of in-patient physical therapy. The study revealed that post-operative ICU psychosis occurred in 161 patients, post-operative patients with ICU psychosis had significantly longer stays $p<0.001$ and prevalence of falls greater in ICU psychosis patients than patients without post-operative ICU psychosis. Also this study result showed that ICU psychosis after cardiac surgeries have poor outcomes when compared to patients with no ICU psychosis.

Irene et al [2014] undertook a study to evaluate the heart rate variability in the intensive care unit's patients with ICU psychosis. The researcher assessed 726 intensive care unit patients who fulfilled inclusion criteria and excluded the conditions affecting heart rate. Heart rate variability measured in the frequency domain. Autonomic nervous system activity assessed indirectly by measurement of heart rate variability, with three heart rate variability analysis method. Time interval changes between two consecutive heart beat were assessed. This first explorative study result showed on heart rate

variability and ICU psychosis, suggested that sympatho-vagal balance seems not to be altered in ICU psychosis.

Nina smelter et al [2013] conducted a study to explore the ICU psychosis after cardiac surgery. The study was aimed to explore the incidence and risk factors of ICU psychosis among 142 patients more than 70 years old. They were reviewed for analysis and assessed. They were monitored pre-operatively and post-operatively. ICU psychosis was diagnosed with mini mental status examination and organic brain syndrome scale. The study result showed 78 patients (54.9%) had ICU psychosis and showed a positive association between both pre-disposing and precipitating factors.

Sandra Koster et al [2011] conducted a systematic review of literature limited to last 10 years using pubmed, cochrane and CINHAL library data base. The literature review revealed 27 risk factors. Among 15 precipitating and 12 predisposing factors for developing ICU psychosis in post-operative cardiac patients. Multifactorial risk model was used to identify the patients at increased risk of developing post-operative ICU psychosis in cardiac patients. Highly established predisposing risk factors were atrial fibrillation, cognitive impairment, depression, past history of stroke, peripheral vascular disease and other age. Most established precipitating risk factors like blood transfusion and abnormal albumin level was reported. Use of intra-aortic balloon pump, ionotropic medical instruments, cardiac output are most relevant risk factors associated with post-operative ICU psychosis.

Sandra Koster et al [2009] undertook an observational study to recognize ICU psychosis early in cardiac surgery. Researcher selected 112 elective cardiac surgical patients, delirium observation screening scale was used to recognize ICU psychosis and also consulted with psychiatrist to confirm the diagnosis and then compared the length of hospital stay by using wilcoxon's rank sum test in patients with and without ICU psychosis. The study result revealed that incidence of ICU psychosis following cardiac surgery was 21.4% and two and a half days of mean duration of ICU psychosis. Patients with ICU psychosis stayed in hospital 11 days longer. The specificity and sensitivity of the ICU psychosis observation scale was 100%, Also early recognition helps in good post-operative management.

Yu-ling Chang et al [2008] conducted retrospective chart review of 288 patients to identify the prevalence and risk factors for post-operative ICU psychosis in cardiovascular intensive care unit. Risk factors were identified using the designed checklist of 52 patients related risk factors for ICU psychosis to collect pre-operative, intra-operative, post-operative data. Univariate analysis and multivariate logistic regression were used for data analysis. Results revealed that prevalence of post-operative ICU psychosis was 41.7%, cardiogenic shock, haematocrit level <30%, hypoalbuminemia and acute infection were significant risk factors for ICU psychosis.

2.3 Reviews related to ABCDE bundle and other interventions for ICU psychosis.

Katarzyna Zamoscik [2017] in a qualitative study to identify the experiences and perception of ICU psychosis and care of ICU psychosis patients among intensive care nurses from medical and surgical intensive care unit, given with 2 focus group sessions. And the data analysed by using Braun and clarke's frame. The research findings revealed seven themes regarding ICU psychosis. The themes were unpleasant nature of ICU psychosis, ICU psychosis as a secondary priority, distrust in ICU psychosis management, scepticism about ICU psychosis assessment, value of communication, Need for reviewed ICU psychosis policy and non-pharmacological therapy for ICU psychosis. Study concluded that nurses described less priority for ICU psychosis in intensive care units. And also nurses discussed about difficulties in assessing ICU psychosis and less effective therapies to treat the ICU psychosis. They also expressed their readiness to challenge of providing quality care for ICU psychosis.

Marion L. Mishel [2017] conducted a randomised control trial at Australia with randomly selected 61 family members. They were in 2 groups, 32 members in control group and 29 members in experimental group. In experimental group family members gave orientation to the patients with the use of family photographs, photos of their surroundings each day. Also made the family members to do the sensory check-up that includes vision and hearing by providing patients hearing aids and glasses and made them to discuss with family life. Nurses gave the instruction to family members and they assessed feasibility and acceptability. Then the ICU psychosis assessed by using CAM-ICU and GCS. Study result revealed that level of ICU psychosis came down after implementation of family intervention.

Boehm L M [2016] conducted a focus group study on inter professional perspective on ABCDE (awakening, breathing co-ordination, delirium monitoring and exercises) bundle implementation. The study conducted among 2 separate focus groups from medical and surgical intensive care unit, which includes nurses, physical therapist, respiratory therapist and occupational therapist with a total of 16 participants who had experience in performing ABCDE bundle. The study results revealed that physical environment, task burden, organizational fact, labour quantity and quality were noted to influence ABCDE bundle. The study also emphasized on protocol development, inter professional training, adequate staffing and role modelling effective methods for successful ABCDE bundle implementation.

Domingo Palacious et al [2016] conducted a qualitative study to assess the experience of doctors and nurses efficiency in managing the ICU psychosis at ICU and described about the ICU psychosis management process. They selected 5 ICUs and categorized 7 focus groups and again divided groups into three. 3 doctors' focus groups and 3 nurses' focus groups, each group consisting of 6-10 participants. Participants of the study were doctors and nurses with more than one year of experience in the intensive care unit with clinical experience in handling ICU psychosis. Total of 38 professionals which included 19 doctors and 19 nurses. Semi structure questionnaire guide was used to assess the efficiency. The group divided into two. One group moderator, who encourage participants and open group discussion regarding various perspective and management criteria for ICU psychosis by giving different scenarios. The study result identified 3 important themes regarding the management of ICU psychosis1) Implementation of pharmacological and non-pharmacological management. 2) Professional perspective on ICU psychosis. 3) Organization of work in the intensive care unit. Nurses found difficulties in management of sleep disorders and early mobilization. They encountered lack of protocol for ICU psychosis management, also they felt that doctors not considering ICU psychosis as a priority of urgency in intensive care unit. These findings were helpful to promote the implementation of specific protocols for ICU psychosis patients.

Mandy Bounds et al [2016] conducted a study among ICU patients to assess the effectiveness of ABCDE bundle on prevalence of ICU psychosis. The ABCDE bundle consist of awakening trials, breathing trials and co-ordination, delirium monitoring and

exercises ,through a retrospective data analysis which was done before and after implementation of ABCDE bundle. Total 159 records reviewed and the study concluded that the prevalence of ICU psychosis decreased significantly and the mean number of days of ICU psychosis decreased significantly $p<0.01$ after ABCDE bundle implementation.

Mandy Bounds et al [2016] conducted a retrospective data analysis of before and after implementation of ABCDE bundle to assess the effect of ABCDE bundle on prevalence of ICU psychosis in intensive care unit's patients. The tool which is used for assessing ICU psychosis was Intensive care delirium screening checklist. The patients with at least one positive delirium score were taken for the study. Total 159 samples among 80 before and 79 after implementation of ABCDE bundle. Implementation of ABCDE bundle decreases the ICU psychosis significantly from 38% to 23% and mean number of days of ICU psychosis decreased from 3.8-1.7 days. Study result showed significant decrease in the prevalence and duration of ICU psychosis in ICU patients.

Pinto F et al [2016] conducted a survey on nurses knowledge and attitude towards ABCDE bundle in the ICU. The investigator administered close ended questions. The study results revealed that only 41.6% of the respondents were aware of ABCDE bundle implementation for ICU psychosis and 67% of them agreed the potential capability of ABCDE bundle in improving the patient's outcomes.

Stacey. L. Kram et al [2015] conducted an evidence based, multidisciplinary approach study to obtain patient's outcomes in the intensive care unit. Introduced ABCDE bundle to minimize the deleterious effects of prolonged hospitalization, including ICU psychosis, the researcher selected intensive care unit's of two hospitals in a rural health care system, prior to implementation of ABCDE bundle. Johns hopkins nursing evidence practice model was used to grade the body of evidence and also current practices of the intensive care units with regard to ABCDE bundle components were assessed by using American critical care nurses association's ABCDE bundle, staff nurses education on implementation of ABCDE bundle. After implementation retrospective chart review electronic medical record was used to obtain pre-bundle intervention data. Data collected from 47 patients in pre bundle group and 36 patients in post bundle group. The study revealed that ABCDE bundle implementation decreased the average patient's hospital stay by 1.8days and ICU psychosis prevalence of 19% over three months. Also

this study result showed that ABCDE bundle can even be implemented in rural hospitals which provide safe cost-effective methods to improve patient outcomes and reduced level of ICU psychosis.

Mathew Van der et al [2014] conducted a systematic review through embase, pubmed, CINAHL, cochrane and psychinfo for 14 years to study on implementation strategies for ICU psychosis monitoring, prevention and effective management of ICU psychosis and its efficacy. This helps to change the current practices regarding ICU psychosis management in ICU and to improve patient outcome. They attained this goal by selected reviews, tried to address each review with why and how questions. The 'why' aspect of approach revealed that many studies reported multi-component implementation was effective in management of ICU psychosis.

Michale .C. Balas.et al [2014] conducted a prospective cohort study and tried to explore the effectiveness and safety of implementing the awakening, breathing co-ordination, delirium monitoring and early exercise (ABCDE) bundle into 296, ICU patients. Usual care was given during pre-implementation period. In the post implementation period all patients received the intervention, safety screen and success failure criteria used for assessing the effectiveness and safety of ABCDE bundle. The study revealed that patients managed with ABCDE bundle experienced less delirium and reduced time in the ventilator.

Christopher. J. Michard [2013] conducted a retrospective study to assess the effect of early pharmacological intervention of a positive score delirium patients. They selected 200 intubated patients with positive delirium score and grouped into two. 98 in experimental group and 102 in control group from a mixed ICU. They were assessed by using Intensive care delirium screening checklist. For the experimental group they initiated with pharmacologic management for 24 hours of positive delirium score. And assessed both the groups for number of days in physical restraints, extubation time after delirium, ICU length of stay and hospital duration of stay. This study revealed that the experimental group showed shorter median time in physical restraints, time to extubation compare with control group 3 Vs 6 days in each group respectively. The findings also showed shorter ICU stay and hospital length of stay when compared to control group. The study concluded that early pharmacological intervention, beneficial for patient with ICU psychosis.

METHODOLOGY

CHAPTER –3

RESEARCH METHODOLOGY

The methodology in the research study is defined as the way the information is gathered in order to answer the research questions or to analyze the research problem. The research methodology involves a systematic procedure by which the researcher starts from initial identification of the problem to its conclusion.

This chapter deals with the methodology adopted for the study. It includes the research design, variables, setting, population, sample and criteria for selection of the sample, sample size, sampling technique, development and description of the tool, content validity, pilot study, reliability of the tool, data collection procedure and plan for data analysis.

3.1 RESEARCH APPROACH

A research approach is an applied form of research that involves finding out how a specific program, practice, procedure or policy is working well **(Polit & Hungler, 2012).** Quantitative research approach was adopted for this study.

An experimental research is generally applied where the target is to determine the extent to which a given procedure meets the desired result. In this study the investigator was interested to assess the level of ICU psychosis two times after administration of modified ABCD bundle. The experimental approach seemed to be the most appropriate approach.

3.2 RESEARCH DESIGN

It refers to the overall plan for obtaining answer in the research questions for testing the research hypothesis **(Polit & Hungler).**

ICU psychosis is a subjective entity. One of the best ways to assess the effectiveness of modified ABCD bundle on ICU psychosis experienced by the patient is by comparison. The comparison was done between the patients receiving modified

ABCD bundle and patients receiving the hospital routine. Equal opportunity was provided for the control and experimental group by random sampling.

The research design selected for the study was true experimental post-test only designscomprising of randomization, manipulation and control in order to validate the outcome of this study.

R A N D A M I Z A T I O N	**GROUP**	**INTERVENTION**	**POST TEST-I 3rd POD**	**POST TEST -II 4th POD**
	EXPERIMENTAL GROUP	Modified ABCD Bundle + Hospital routine care	O_1	O_2
	CONTROL GROUP	Hospital routine care only	O_1	O_2

The design used for this study is represented as

O_1 –Post-test I assessment of level of ICU psychosis among cardiac post-operative patient.

O_2 –Post-test II assessment of level of ICU psychosis among cardiac post-operative patient.

In post-test only design, the dependent variable measured two times after the independent variable introduced to obtain the effect of independent variable.

3.3 VARIABLES

A variable is an attribute that takes on different values **(Polit & Hungler, 2012)**

3.3.1 Attribute Variables

A variable that confounds the relationship between the independent and dependent variables that needs to be controlled either in the research design or through statistical procedures **(Polit & Hungler, 2012)** It is some variable which has influence but has not been manipulated by researchers.

Demographic variables consisted of parameters such as age, gender, educational qualification, monthly income, occupation and marital status in this study.

3.3.2 Independent Variable:

The independent variable of the study was modified ABCD bundle.

3.3.3 Dependent Variable

The dependent variable of the study was level of ICU psychosis.

3.4 RESEARCH SETTING

A setting is the physical location and condition in which data collection takes place in the study **(Polit & Hungler, 2012).**

The study was conducted at Madras Medical Mission Hospital, Chennai. It is a 285 bedded multi-speciality hospital. With regard to cardiology it has a 225 bedded cardiothoracic unit which consists of cath lab, cardiac OT, adult ICU, step-down ICU and cardiac wards. After the surgery, the patientsare transferred to the adult ICU from the OT. On the 4thpost-operative day the clients are shifted to the cardiac wards after they are deemed fit.It has 5 cardiac operation theatres in which an average of 100 open heart surgeries is performed every month. The researcher conducted the study at adult ICU which was 25 bedded post-operative ICU receiving patients immediately after the surgery from cardiac operation theatre.

3.5 POPULATION

A population is the entire aggregation of clients with similar characteristics and on whom the researcher would generalize the study findings. The population encompasses the target population and accessible population.

3.5.1 Target Population

All the cardiac post-operative patients who had undergone cardiac surgeries like coronary artery bypass graft - on pump, coronary artery bypass graft - off pump, valve replacement or valve repair surgeries in Tamil Nadu.

3.5.2 Accessible Population

All the cardiac post-operative patients who had undergone cardiac surgeries like coronary artery bypass graft - on pump, coronary artery bypass graft - off pump, valve replacement or valve repair surgeries at Madras Medical Mission Hospital. Approximately 125 cardiac surgeries are performed every month.

3.6 SAMPLE

According to **Polit and Hungler (2012),** sample consists of subset of units that comprise the population. In the present study, the samples were all the cardiac post-operative patients, who had undergone cardiac surgeries like coronary artery bypass graft - on pump, coronary artery bypass graft - off pump, valve replacement or valve repair surgeries in at Madras Medical Mission Hospital, who fulfilled the sample selection criteria.

3.7 SAMPLE SIZE

The total sample consisted of 60 cardiac post-operative patients (30 in study group and 30 in control group) who were transferred to adult ICU from cardiac OT after surgery and who fulfilled the sample selection criteria.

3.8 SAMPLING TECHNIQUE

Sampling technique refers to the process of selecting a group of people, events and other elements that are representative of the population being studied **(Polit & Hungler, 2012)**

At first, the surgery list of all cardiac patients posted for the surgery was collected on daily basis from the reception by the researcher. Then as the patients received at cardiac wards from the reception the samples that fulfilled the sample selection criteria were selected by simple random sampling technique using lottery method. The investigator allocated the samples on the basis of lots, those who took chit **"E"** were

assigned to the experimental group and the samples who took chit **"C"** were assigned to the control group. Similarly the investigator had selected 60 samples with 30 each in the experimental and control group during all four weeks of data collection.

3.9 CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria

1. Patients who were between the age group of 20 to 70 years.
2. Patients who had first time experience to cardiac surgeries (CABG or OPCAB or valve surgery).
3. Patients who were able to read and write English or Tamil.
4. Patients who were willing to participate in the study.

Exclusion Criteria

1. Patients who were in an unconscious state.
2. Patients who were hemodynamically unstable.
3. Patients who were not extubated from mechanical ventilators within 24 hours.
4. Patients with history of psychiatric illness

3.10 DEVELOPMENT AND DESCRIPTION OF THE TOOL

Tool consists of two sections. An extensive literature review, discussion with the experts and the investigators own professional experience helped the investigator in the development of tool for data collection.

Section A: Assessment tool

Assessment tool consists of two parts

Part I- Demographic variables

Consisted of age, gender, educational qualification, monthly income, occupation and marital status. The questions had multiple options and the investigator collected the responses by interview method.

Part II-Intensive Care Delirium Screening Checklist (ICDSC)

Assessment of level of ICU psychosis by using Intensive care delirium screening checklist (ICDSC) which is a standardized tool, consisted of 8 items, which are related to signs and symptoms of ICU psychosis. Namely,

1. Altered level of consciousness
2. Inattention
3. Disorientation
4. Hallucination, delusion or psychosis
5. Psychomotor agitation or retardation
6. Inappropriate speech or mood
7. Sleep-wake cycle disturbance
8. Symptom fluctuation

The 8 dimensions were observed by the investigator, each symptom carried 1 mark, total score was 8.

SCORING AND INTERPRETATION

The scores were interpreted as,

Score	Interpretation
0	Normal
1-3	Sub-syndromal delirium
4-8	Delirium

The intensive care delirium screening checklist consisted of 8 items that are the symptoms of ICU psychosis, the presence of symptom carried 1 mark and absence of symptom carried 0. Total score of the tool was 8.

SECTION B: INTERVENTION TOOL

Modified ABCD bundle is a group of intervention which were given to every cardiac post-operative patients to prevent ICU psychosis. The four distinct components of the modified ABCD bundle were,

1. Awakening
2. Breathing exercises
3. Cognitive stimulating activities
4. Daily exercises

Awakening (Pre-operative period)

A pre-operative period intervention starts a day before surgery.

Orientation to patient and family about,

- ICU –setup,
- ICU –team,
- ICU-policies and rules,
- Stages of recovery.

Post-operative period

Post-operative period awakening starts when the patient was weaned of from sedation and able to respond

Post-operative orientation about

- Time
- Place
- Person
- Things.

Breathing Exercises

Breathing exercises starts immediately after the extubation from 1st post-operative day to 4th post-operative day.

- Oxygen therapy
- Deep breathing exercises,
- Pursed lip breathing,
- Abdomen breathing,
- Chest breathing,
- Incentive spirometer exercise
- Coughing.

Cognitive stimulating activities:

Cognitive stimulating activities starts from 2nd post-operative day to 4th post-operative day.

- Reading newspaper and books
- Minor calculations and word games

Daily exercise:

- Daily exercise starts from 2nd post-operative day to 4th post-operative day.
- Passive ROM three times a day,
- Turning every 2nd hourly,
- Sitting position for 20 min,
- Sitting on the edge of the bed,
- Active transfer to chair,
- Ambulation for 5 min.

3.11 VALIDATION OF THE TOOL

Validity

The content validity refers to the degree to which the items on an instrument adequately represents the universe of the content **(Polit & Hungler, 2012).**

Content validity of the instrument adequately represents the content for the concept being measured. Content validity of the instrument was established by panel of experts comprising in the field of cardio vascular surgery, anaesthesia, medical surgical nursing and statistics. The experts suggestions were incorporated in designing the final tool for the study in consultation with guide, experts, ethical committee members and statistician for its appropriateness.

The content validity of the data collection tool and intervention protocol was ascertained with the expert's in the following field of expertise. Which was obtained from two cardio-thoracic surgeon, one anaesthetist, one medical expert, three nursing experts in medical surgical nursing.

Modifications were made as per the expert's suggestions and were incorporated in the tool. All the experts had their consensus and then the tool was finalized.

3.12 ETHICAL CONSIDERATION

Ethics is a system of moral values that is concerned with the degree to which the research procedures adhere to the professional, legal and social obligations to the study participants.

The study was carried out after obtaining an ethical clearance from the ethical committee of The Madras Medical Mission Hospital. The following ethical principles were followed and adhered to in the course of study by the researcher.

Ethical Principle	Action Carried out
Principle of beneficence	Potential benefit of modified ABCD bundle was explained to the participants.
Principle of maleficence	No harm certificate obtained from the cardio thoracic surgeon.
Principle of respect for human dignity	Those who were willing to participate were included in the study Informed consent was obtained from the participants.
Principle of confidentiality	The information regarding the samples and their performance were kept confidential.
Principle of Human rights	Ethical committee clearance was obtained. The right to withdraw from the study was ensured before the data collection.

3.13 PILOT STUDY

A pilot study is a miniature version of actual study in which the instruments are administered to the samples drawn from the same population. The purpose of the pilot study was to find the feasibility and applicability of the main study design **(Polit & Hungler, 2012).**

The pilot study was conducted after obtaining ethical committee clearance from the Madras Medical Mission Hospital. For conducting the study a formal written permission was sought from the Director of Cardio-thoracic Surgery, Madras Medical Mission Hospital, The Medical Superintendent and the Nursing Superintendent of the

Madras Medical Mission Hospital. The official information was given to the nursing supervisors and in-charges of AICU and other cardiac departments.

Every day around 5-8 patients underwent cardiac surgery. The investigator selected 6 post-operative cardio-thoracic patients who fulfilled the sample selection criteria, using simple random sampling (lottery) method. The participants who took chit "**E"** were allocated to the experimental group (n=3) and those who took chit "**C"** were allocated to the control group (n=3). A brief explanation was given on the purpose of the study to the participants, oral and written consent was obtained. During the pre-operative period, (day before surgery) demographic data was collected and ABCD bundle component of "Awakening" started along with hospital routine care. During the 1stpost-operative day, awakening component was again reinforced. Immediately after the extubation or on 2nd post-operative day, the other components of ABCD bundle that is breathing, cognitive stimulative activities and daily exercises were initiated and continued till 4th post-operative day. But for the control group hospital routine only was carried out. On 3rd and 4th post-operative day, the post-test I and II assessment to identify the ICU psychosis was carried out for both experimental and control group by using a standardized checklist (ICDSC) consisting of 8 items. The collected data were tabulated and analysed by using both descriptive and inferential statistics. The analysis of the pilot study showed statistical significance at **p<0.05**. The result of the pilot study gave the evidence that the tool and modified ABCD bundle was reliable, feasible and practicable to conduct the main study.

3.14 RELIABILITY

It is the degree of consistency with which an instrument measures the attributes which is designed to measure **(Polit & Hungler, 2012).**

The reliability of the tool Intensive care delirium screening checklist was established by inter-rater method and the reliability score was found to be **r = 0.8.** The reliability findings revealed that the tool was found to be reliable.

3.15 DATA COLLECTION PROCEDURE

The data collection is gathering of information about something which the researcher has chosen to explore or investigate **(Polit & Hungler, 2012)**

The data collection procedure was conducted after obtaining ethical committee clearance from the Madras Medical Mission Hospital. A formal written permission was sought from the Director of Cardio-thoracic surgery, Medical Superintendent and official information was given to Nursing Superintendent, In-charges of AICU and cardiac wards.

Samples were selected and allocated to experimental and control group by using lottery method. The samples were given adequate explanation about the self and the study. Written and oral consent was obtained from both patients and their relatives. Anonymity and confidentiality about the responses was assured. The data were collected under three phases.

Phase -I

Demographic data of the selected samples were collected on the pre-operative day that is a day before surgery followed by for the experimental group. The intervention protocol modified ABCD bundle's component "Awakening" was administered along with hospital routine care. The patients were explained that the intervention will be continued in the 2nd post-operative day onwards.

Phase-II

During the first post-operative day the awakening component which highlights about the orientation was administered. Immediately after the extubation or on 2ndpost-operative day, the other components of modified ABCD bundle that is breathing, cognitive stimulating activities and daily exercises were initiated and continued till 4thpost-operative day. For the control group hospital routine care was only carried out.

Phase-III

During the 3rd post-operative day the post-test I assessment which identifies the level of ICU psychosis, among cardiac post-operative patients, of both experimental and control group, by using intensive care delirium screening checklist was done. During the 4th post-operative day the post-test II assessment which identifies the level of ICU psychosis, among cardiac post-operative patients, of both experimental and control group, by using intensive care delirium screening checklist was administered. The collected data were tabulated for analysis and analysed by using both descriptive and inferential statistics**.**

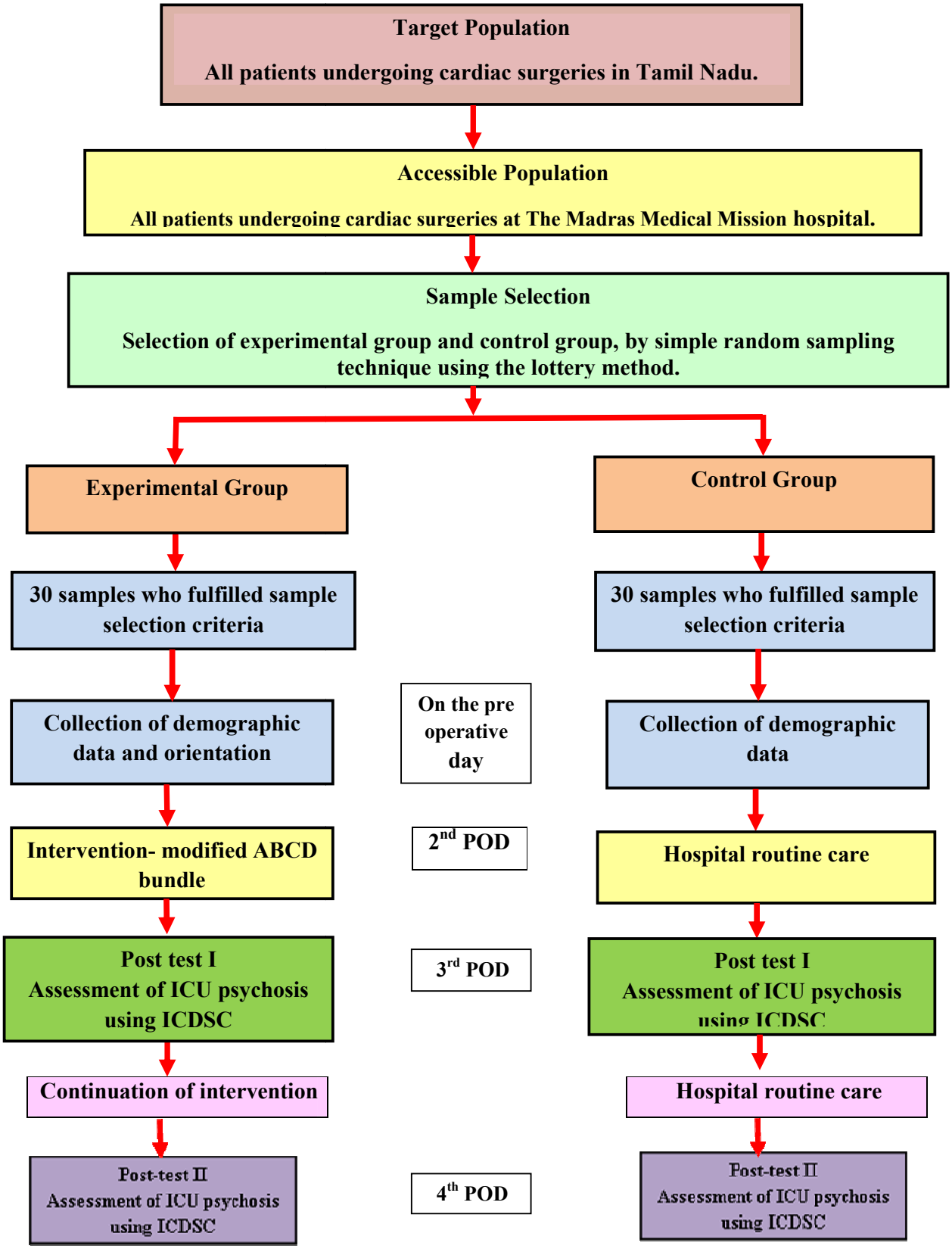

Fig 3.1: Schematic representation of data collection procedure

3.16 PLAN FOR DATA ANALYSIS

Data analysis is the systematic organization, synthesis of research data and testing of null hypothesis by using the obtained data **(Polit & Hungler, 2012).**

Analysis and interpretation of the data were carried out by using both descriptive and inferential statistics.

3.16.1 Descriptive Statistics

1. Frequency and percentage distribution was used to analyse the demographic data of cardiac post-operative patients.
2. Frequency, percentage distribution, means and standard deviation was used to assess the prevalence of ICU psychosis among cardiac post-operative patients.

3.16.2 Inferential Statistics

1. Unpaired t-test was used to assess the effectiveness of modified ABCD bundle on ICU psychosis.
2. Chi-square test was used to associate the post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

DATA ANALYSIS AND INTERPRETATION

CHAPTER – 4

DATA ANALYSIS AND INTERPRETATION

The analysis is a process of organizing and synthesizing the data in such a way that the research questions can be answered and the hypotheses are tested**.**

This chapter deals with the analysis and interpretation of the data collected from 60 cardiac post-operative patients to investigate the effectiveness of modified ABCD bundle on level of ICU psychosis, among cardiac post-operative patients in the experimental and control group. The data were organized, tabulated and analyzed according to the objectives. Data analysis begins with description that applies to the study in which the data are numerical with some concepts. Descriptive statistics allows the researcher to organize the data and to examine the quantum of information and inferential statistics to determine the relationship and causality.

ORGANISATION OF THE DATA

The findings of the study was organized and presented under the following sections.

Section A: Description of the demographic variables of cardiac post-operative patients

Section B: Assessment of post-test level of ICU psychosis among the cardiac post-operative patients in the experimental and control group.

Section C: Effectiveness of modified ABCD bundle on level of ICU psychosis among cardiac post-operative patients in the experimental and control group.

Section D: Association of post-test level of ICU psychosis among the cardiac post-operative patients, with their selected demographic variables in the experimental and control group.

SECTION A: DESCRIPTION OF THE DEMOGRAPHIC VARIABLES OF CARDIAC POST-OPERATIVE PATIENTS.

Table 4.1 : Frequency and percentage distribution of demographic variables of cardiac post-operative patients in the experimental and control group.

N = 60

Demographic Variables	Experimental Group		Control Group		Chi-Square Value
	No.	%	No.	%	
Age of the patient in years					
20 - 30	2	6.67	1	3.33	χ^2=0.936
31 - 40	6	20.00	4	13.33	d.f=4
41 - 50	5	16.67	6	20.00	p=0.919
51 - 60	9	30.00	10	33.33	N.S
61 - 70	8	26.67	9	30.00	
Gender					χ^2=1.667
Male	26	86.67	22	73.33	d.f=1
Female	4	13.33	8	26.67	p=0.197 N.S
Educational status					
Illiterate	1	3.33	1	3.33	χ^2=0.220
Primary school	4	13.33	4	13.33	d.f=5
Middle school	3	10.00	4	13.33	p=0.999
High school	7	23.33	7	23.33	N.S
Intermediate	7	23.33	6	20.00	
Graduate & above	8	26.67	8	26.67	
Occupation					
Unemployed	7	23.33	8	26.67	
Unskilled worker	1	3.33	4	13.33	χ^2=8.819
Semi-skilled worker	5	16.67	1	3.33	d.f=6
Skilled worker	6	20.00	8	26.67	p=0.184
Clerical shop owner, Farmer	6	20.00	2	6.67	N.S
Semi-profession	5	16.67	5	16.67	
Profession	0	0.00	2	6.67	

Demographic Variables	Study Group		Control Group		Chi-Square Value
	No.	%	No.	%	
Monthly family income in Rs.					χ^2=6.987 d.f=5 p=0.222 N.S
<1589	0	0.00	0	0.00	
1590 - 4726	0	0.00	1	3.33	
4727 - 7877	7	23.33	4	13.33	
7878 - 11,816	11	36.67	8	26.67	
11,817 - 15,753	4	13.33	11	36.67	
15,754 - 31,506	5	16.67	2	6.67	
>31507	3	10.00	4	13.33	
Marital status					χ^2=0.583 d.f=3 p=0.900 N.S
Married	25	83.33	23	76.67	
Unmarried	1	3.33	1	3.33	
Separated	1	3.33	1	3.33	
Widowed	3	10.00	5	16.67	

N.S – Not Significant

The above table 1 depicts the frequency and percentage distribution of demographic variables of cardiac post-operative patients in the experimental and control group.

A total of 60 samples participated in the study with 30 in experimental and 30 in the control group. With regard to age, 9(30%) of them were in 51-60 years age group, in experimental group and 10(33.3%) of them were in 51-60 years of age group in control group. Considering the gender, 26(86.67%) samples in the experimental group and 22(73.33%) in the control group were males. Considering education, 8(26.67%) of them were graduates and above and only 1(3.33%) of them had no formal education in the experimental group and control group. With regard to occupation, 7(23.33%) of them were unemployed and none of them were professionals in the experimental group. Likewise in the control group 8(26.67%) of them were unemployed and 8(26.67) of them were skilled workers and 1(3.33%) of them were semi-skilled worker.

With regard to monthly income of the family, in the experimental group, 11(36.67%) of them had an income of Rs.7878 to Rs.11,816 and (0%) none of them had an income below Rs.4726. In the control group, 11(36.67%) of them had an income of Rs.11,817 to Rs.5,753 and none of them had an income below Rs.1589. With regard to marital status, in the experimental group 25 (83.33%) of them were married and in the control group, 23(76.67%) were married. The study findings revealed that majority of the samples were males,married between the age group of 51-60 years with graduates and above qualification and most of them were unemployed. And theirincome between Rs.7878-11816 .

The chi-square test revealed that there is no statistical significance in the demographic variable between the experimental and control group which confirmed the homogeneity of the samples.

SECTION B: ASSESSMENT OF POST TEST LEVEL OF ICU PSYCHOSIS AMONG THE CARDIAC POST-OPERATIVE PATIENTS IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.2: Frequency and percentage distribution of post-test I and post-test II level of ICU Psychosis among cardiac post-operative patients in the experimental group.

N = 30

Experimental Group	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)	
	No.	%	No.	%	No.	%
Post-test I	9	30.0	20	66.67	1	3.33
Post-test II	16	53.33	14	46.67	0	0

The above table 2 depicts the frequency and percentage distribution of level of ICU psychosis among cardiac post-operative patients in the experimental group.

The study findings showed that post-test I of ICU psychosis revealed that 9(30%) had normal and 20(66.67%) had sub-syndromal delirium and 1(3.33%) had delirium. The post-test II findings revealed that 16(53.33%) had normal and 14(46.67%) had sub-syndromal delirium and (0%) none of them had delirium. When observed the level of ICU psychosis in the experimental group,the post-test I and post-test II levels of ICU psychosis indicated that the number of patients with ICU psychosis decreased from post-test I to post-test II .

The samples of the experimental group experienced reduced level of ICU psychosis. The findings revealed that modified ABCD bundle had an impact on reducing the level of ICU psychosis among the cardiac post-operative patients of the experimental group.

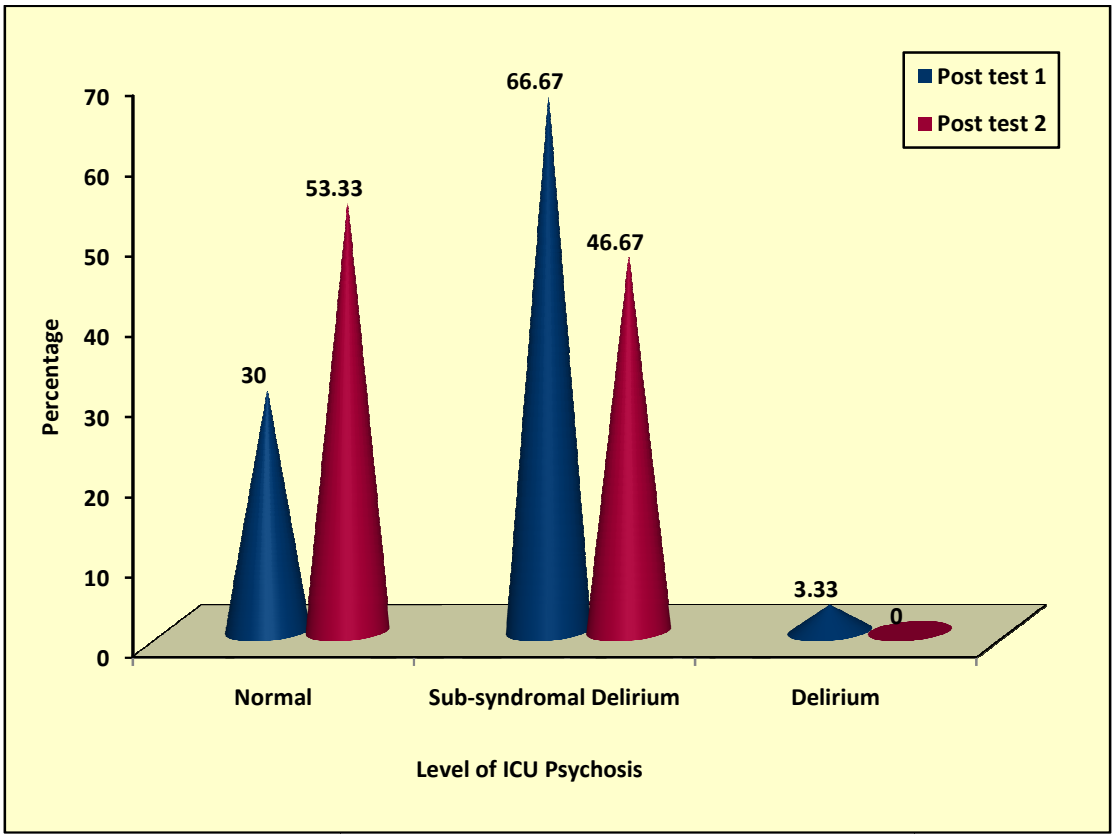

Fig 4.1:Percentage distribution of post-test I and post-test II level of ICU Psychosis, among cardiac post-operative patients in the experimental group

Table 4.3: Frequency and percentage distribution of post test I and post test II level of ICU psychosis among cardiac post-operative patients in the control group.

N = 30

Control Group	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)	
	No.	%	No.	%	No.	%
Post-test I	1	3.3	17	56.67	12	40.0
Post-test II	4	13.3	12	40.0	14	46.67

The above table 3 depicts the frequency and percentage distribution of level of ICU psychosis among cardiac post-operative patients in the control group.

The findings revealed that regarding Post-test I, 1(3.3 %) had normal and 17(56.67%) had sub-syndromal delirium and 12(40%) had delirium. The post-test II findings revealed that 4(13.33%) had normal and 12(40.0%) had sub-syndromal delirium and 14(46.67%) of them had delirium.

The findings indicated the number of patients with ICU psychosis increased from post-test I to post-test II. The findings also indicated that the hospital routine does not have a beneficial effect on the level of ICU psychosis of the cardiac post-operative patients.

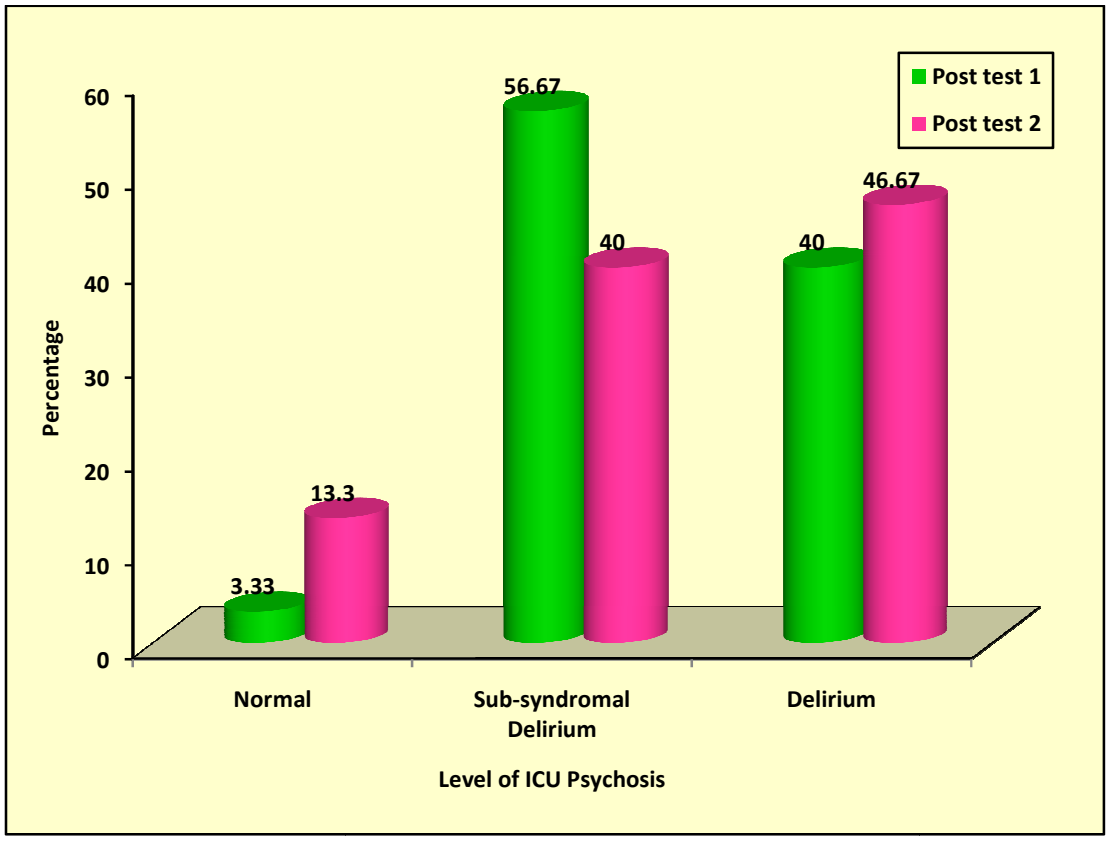

Fig 4.2: Percentage distribution of post-test I and post test II level of ICU Psychosis, among cardiac post-operative patients in the control group

SECTION C: EFFECTIVENESS OF MODIFIED ABCD BUNDLE ON LEVEL OF ICU PSYCHOSIS AMONG CARDIAC POST-OPERATIVE PATIENTS IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.4: Comparison of post test I and post test II ICU psychosis scores among cardiac post-operative patients within and between the experimental and control group.

N = 60(30+30)

Group	**Post-test I**		**Post-test II**		**Paired 't' Value**
	Mean	**S.D**	**Mean**	**S.D**	
Experimental Group	1.20	1.09	0.63	0.81	**t = 2.984 p = 0.006, S****
Control Group	3.23	1.67	3.06	1.74	t = 0.530 p = 0.600, N.S
Unpaired 't' Value	**t = 5.565 p = 0.000, S*****		**t = 6.944 p = 0.000, S*****		

***p<0.001, **p<0.01, S– Significant, N.S – Not Significant

The above table 4 describes the comparison of post-test I and post-test II ICU psychosis scores among cardiac post-operative patients within and between the experimental and control group.

Regarding the comparison of experimental and control group in the post-test I revealed that, the mean score was 1.20 with the SD of 1.09 in the experimental group and in the control group the mean score was 3.23 with the SD of 1.67. The students unpaired 't' test value**t= 5.565** revealed that there is high statisticalsignificance between the experimental group and control group in post-test I **at p <0.001** level which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis among the cardiac post-operative patients.

Regarding the comparison of experimental and control group in the post-test II revealed that, the mean score was 0.63 with the SD of 0.81 in the experimental group and

in the control group the mean score was 3.06 with the SD of 1.74. The students unpaired 't' test **t= 6.944** also revealed that there is high statisticalsignificancebetween the experimental group and control group in post-test II **at p<0.001** level which proved that modified ABCD bundle had sustained significant impact on level of ICU psychosis among the cardiac post-operative patients.

The paired 't' test revealed that there is statistically significant difference between the post-test I and post-test II in the experimental group with **t = 2.984 at p<0.01** level which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis, among the cardiac post-operative patients. The paired 't' test revealed that there is no statistically significant difference between the post-test I and post-test II in the control group with t = 0.530 at p>0.01.

The study findings revealed that modified ABCD bundle had immediate and sustained effect on reducing the level of ICU psychosis among the cardiac post-operative patients.

SECTION D: ASSOCIATION OF POST TEST LEVEL OF ICU PSYCHOSIS AMONG THE CARDIAC POST-OPERATIVE PATIENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLES IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 4.5: Association of post-test I level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the experimental group.

N = 30

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							χ^2=5.693 d.f = 8 p = 0.682 N.S
20 - 30	0	0	2	6.7	0	0	
31 - 40	1	3.3	4	13.3	1	3.3	
41 - 50	2	6.7	3	10.0	0	0	
51 - 60	3	10.0	6	20.0	0	0	
61 - 70	3	10.0	5	16.7	0	0	
Gender							**χ^2=7.933 d.f = 2 p = 0.019 S***
Male	9	30.0	17	56.7	0	0	
Female	0	0	3	10.0	1	3.3	
Educational status							χ^2=12.012 d.f = 10 p = 0.284 N.S
Illiterate	1	3.3	0	0	0	0	
Primary school	0	0	4	13.3	0	0	
Middle school	0	0	3	10.0	0	0	
High school	3	10.0	4	13.3	0	0	
Intermediate	4	13.3	3	10.0	0	0	
Graduate & above	1	3.3	6	20.0	1	3.3	
Occupation							χ^2=11.725 d.f = 10 p = 0.304 N.S
Unemployed	1	3.3	5	16.7	1	3.3	
Unskilled worker	0	0	1	3.3	0	0	
Semi-skilled worker	0	0	5	16.7	0	0	
Skilled worker	3	10.0	3	10.0	0	0	
Clerical shop owner, Farmer	4	13.3	2	6.7	0	0	
Semi-profession	1	3.3	4	13.3	0	0	
Profession	-	-	-	-	-	-	

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Monthly family income in Rs.							χ^2=9.143 d.f = 8 p = 0.330 N.S
<1589	-	-	-	-	-	-	
1590 – 4726	-	-	-	-	-	-	
4727 – 7877	1	3.3	6	20.0	0	0	
7878 - 11,816	2	6.7	8	26.7	1	3.3	
11,817 - 15,753	3	10.0	1	3.3	0	0	
15,754 - 31,506	1	3.3	4	13.3	0	0	
>31507	2	6.7	1	3.3	0	0	
Marital status							**χ^2=32.160 d.f = 6 p = 0.000 S*** **
Married	9	30.0	16	53.3	0	0	
Unmarried	0	0	1	3.3	0	0	
Separated	0	0	0	0	1	3.3	
Widowed	0	0	3	10.0	0	0	

*p<0.05, ***p<0.001, S – Significant, N.S – Not Significant

The table 5 depicts the association of selected demographic variables with post-test I level of ICU psychosis among cardiac post-operative patients in the experimental group.

The findings revealed that a statistically significant association was found between the post-test I level of ICU psychosis and the demographic variable,gender (**χ^2= 7.933 at p <0.05**) and marital status (**χ^2 =32.160 at p<0.001)** and there was no statistically significant association found between the post-test I levels of ICU psychosis and the other demographic variables such as age, educational status, occupation and monthly family income in the experimental group.

The findings revealed that male and married people exhibited the signs and symptoms of sub-syndromal delirium.

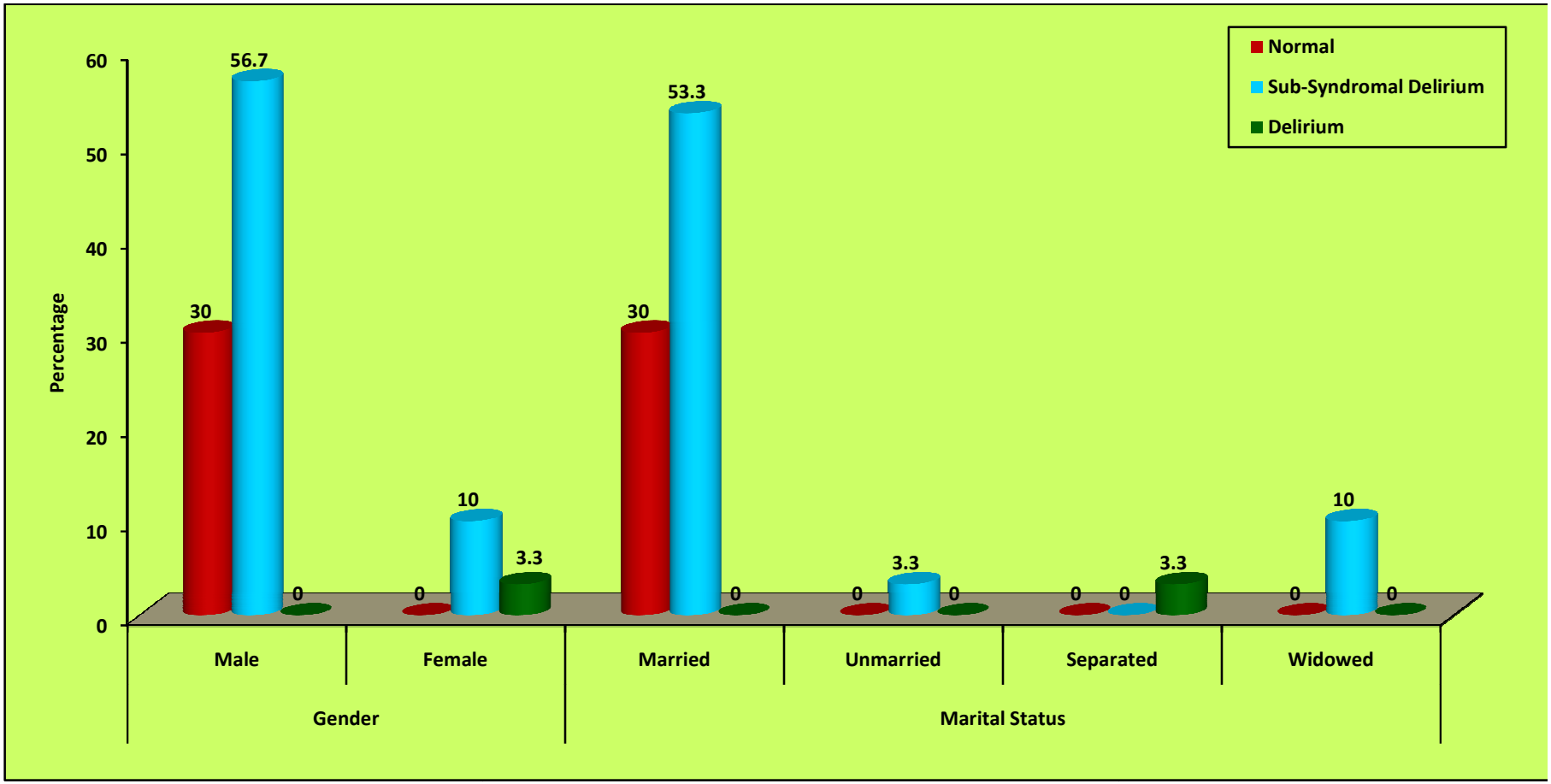

Fig 4.3: Association of post test I level of ICU psychosis, among cardiac post-operative patients with their selected demographic variables such as gender and marital status in the experimental group

Table 4.6: Association of post-test II level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the experimental group.

N = 30

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Chi-Square Value
	No.	%	No.	%	
Age in years					χ^2=5.693 d.f = 8 p = 0.682 N.S
20 - 30	1	3.3	1	3.3	
31 - 40	2	6.7	4	13.3	
41 - 50	3	10.0	2	6.7	
51 - 60	4	13.3	5	16.7	
61 - 70	6	20.0	2	6.7	
Gender					χ^2=1.499 d.f = 1 p = 0.222 N.S
Male	15	50.0	11	36.7	
Female	1	3.3	3	10.0	
Educational status					χ^2=7.974 d.f = 5 p = 0.158 N.S
Illiterate	0	0	1	3.3	
Primary school	3	10.0	1	3.3	
Middle school	0	0	3	10.0	
High school	5	16.7	2	6.7	
Intermediate	5	16.7	2	6.7	
Graduate & above	3	10.0	5	16.7	
Occupation					χ^2=6.371 d.f = 5 p = 0.272 N.S
Unemployed	4	13.3	3	10.0	
Unskilled worker	0	0	1	3.3	
Semi-skilled worker	1	3.3	4	13.3	
Skilled worker	4	13.3	2	6.7	
Clerical shop owner, Farmer	5	16.7	1	3.3	
Semi-profession	2	6.7	3	10.0	
Profession	-	-	-	-	

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Chi-Square Value
	No.	%	No.	%	
Monthly family income in Rs.					χ^2=6.846 d.f = 4 p = 0.144 N.S
<1589	-	-	-	-	
1590 – 4726	-	-	-	-	
4727 – 7877	4	13.3	3	10.0	
7878 - 11,816	3	10.0	8	26.7	
11,817 - 15,753	4	13.3	0	0	
15,754 - 31,506	3	10.0	2	6.7	
>31507	2	6.7	1	3.3	
Marital status					χ^2=2.571 d.f = 3 p = 0.463 N.S
Married	14	46.7	11	36.7	
Unmarried	1	3.3	0	0	
Separated	0	0	1	3.3	
Widowed	1	3.3	2	6.7	

N.S – Not Significant

The table 6 inferred the association of selected demographic variables with post-test II level of ICU psychosis among cardiac post-operative patients in the experimental group.

The findings revealed that none of the demographic variables had shown statistically significant association with post-test II level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the experimental group.

Table 4.7: Association of post-test I level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the control group.

N = 30

Demographic Variables	Normal (0)		Sub-syndromal delirium (1– 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							
20 - 30	0	0	0	0	1	3.3	χ^2=8.336
31 - 40	0	0	1	3.3	3	10.0	d.f = 8
41 - 50	1	3.3	3	10.0	2	6.7	p = 0.401
51 - 60	0	0	7	23.3	3	10.0	N.S
61 - 70	0	0	6	20.0	3	10.0	
Gender							χ^2=0.722
Male	1	3.3	13	43.3	8	26.7	d.f = 2
Female	0	0	4	13.3	4	13.3	p = 0.697
							N.S
Educational status							
Illiterate	0	0	1	3.3	0	0	χ^2=9.154
Primary school	0	0	4	13.3	0	0	d.f = 10
Middle school	0	0	2	6.7	2	6.7	p = 0.518
High school	0	0	4	13.3	3	10.0	N.S
Intermediate	0	0	4	13.3	2	6.7	
Graduate & above	1	3.3	2	6.7	5	16.7	
Occupation							
Unemployed	0	0	5	16.7	3	10.0	
Unskilled worker	0	0	2	6.7	2	6.7	**χ^2=25.460**
Semi-skilled worker	0	0	1	3.3	0	0	**d.f = 12**
Skilled worker	0	0	6	20.0	2	6.7	**p = 0.013**
Clerical shop owner, Farmer	0	0	2	6.7	0	0	**S***
Semi-profession	0	0	0	0	5	16.7	
Profession	1	3.3	1	3.3	0	0	

Demographic Variables	Normal (0)		Sub-syndromal delirium (1– 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Monthly family income in Rs.							
<1589	-	-	-	-	-	-	
1590 – 4726	0	0	1	3.3	0	0	
4727 – 7877	0	0	1	3.3	3	10.0	χ^2=10.695
7878 - 11,816	0	0	4	13.3	4	13.3	d.f = 10
11,817 - 15,753	0	0	8	26.7	3	10.0	p = 0.382
15,754 - 31,506	0	0	1	3.3	1	3.3	N.S
>31507	1	3.3	2	6.7	1	3.3	
Marital status							χ^2=4.806
Married	1	3.3	15	50.0	7	23.3	d.f = 6
Unmarried	0	0	0	0	1	3.3	p = 0.569
Separated	0	0	0	0	1	3.3	N.S
Widowed	0	0	2	6.7	3	10.0	

*p<0.05, S – Significant, N.S – Not Significant

The table 7 indicates the association of selected demographic variables with post-test I level of ICU psychosis among cardiac post-operative patients in the control group.

The findings revealed that a statistically significant association was found between the post-test I level of ICU psychosis, and the demographic variable, occupation **(χ2= 25.460 at p <0.05)** and there was no statistically significant association found between the post- test I levels of ICU psychosis and the other demographic variables such as age, educational status, occupation and monthly family income in the control group.

The findings revealed that skilled workers exhibited the signs and symptoms of sub- syndromal delirium.

Table 4.8: Association of post-test II level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the control group.

N = 30

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							
20 - 30	0	0	1	3.3	0	0	χ^2=7.024
31 - 40	0	0	2	6.7	2	6.7	d.f = 8
41 - 50	1	3.3	2	6.7	3	10.0	p = 0.534
51 - 60	3	10.0	4	13.3	3	10.0	N.S
61 - 70	0	0	3	10.0	6	20.0	
Gender							χ^2=1.753
Male	4	13.3	8	26.7	10	33.3	d.f = 2
Female	0	0	4	13.3	4	13.3	p = 0.416
							N.S
Educational status							
Illiterate	0	0	0	0	1	3.3	χ^2=6.475
Primary school	0	0	2	6.7	2	6.7	d.f = 10
Middle school	1	3.3	2	6.7	1	3.3	p = 0.774
High school	1	3.3	2	6.7	4	13.3	N.S
Intermediate	0	0	4	13.3	2	6.7	
Graduate & above	2	6.7	2	6.7	4	13.3	
Occupation							
Unemployed	0	0	3	10.0	5	16.7	
Unskilled worker	0	0	2	6.7	2	6.7	χ^2=20.500
Semi-skilled worker	0	0	0	0	1	3.3	d.f = 12
Skilled worker	1	3.3	4	13.3	3	10.0	p = 0.058
Clerical shop owner, Farmer	1	3.3	1	3.3	0	0	N.S
Semi-profession	0	0	2	6.7	3	10.0	
Profession	2	6.7	0	0	0	0	

Demographic Variables	Normal (0)		Sub-syndromal delirium (1 – 3)		Delirium (4 – 8)		Chi-Square Value
	No.	%	No.	%	No.	%	
Monthly family income in Rs.							χ^2=12.930 d.f = 10 p = 0.228 N.S
<1589	-	-	-	-	-	-	
1590 – 4726	0	0	0	0	1	3.3	
4727 – 7877	0	0	1	3.3	3	10.0	
7878 - 11,816	0	0	4	13.3	4	13.3	
11,817 - 15,753	1	3.3	5	16.7	5	16.7	
15,754 - 31,506	1	3.3	0	0	1	3.3	
>31507	2	6.7	2	6.7	0	0	
Marital status							χ^2=5.634 d.f = 6 p = 0.465 N.S
Married	4	13.3	10	33.3	9	30.0	
Unmarried	0	0	1	3.3	0	0	
Separated	0	0	0	0	1	3.3	
Widowed	0	0	1	3.3	4	13.3	

N.S – Not Significant

The table 11 shows the association of selected demographic variables with post-test II level of ICU psychosis among cardiac post-operative patients in the control group.

The findings revealed that none of the demographic variables had shown statistically significant association with post-test II level of ICU psychosis among cardiac post-operative patients with their selected demographic variables in the control group.

DISCUSSION

CHAPTER – V

DISCUSSION

This chapter deals with the detailed discussion on the findings of the study interpreted by statistical analysis. The findings are discussed in relation to the objectives and hypothesis of the study.

The present study was executed to assess the effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients. The findings of the study proved that there was a significant reduction in the level of ICU psychosis after the intervention modified ABCD bundle. The findings are discussed objective wise and presented below.

Description of demographic variables

The selected demographic variables of the study were age, gender, educational qualification, occupation, monthly income and marital status. A total of 60 samples participated in the study with 30 in experimental and 30 in the control group.

With regard to age in years, 9(30%) of them were in 51-60 years age group. In experimental group and 10(33.33%) of them were in 51-60 years age group in control group. Considering the gender, 26(86.67%) samples in the experimental group and 22(73.33%) in the control group were males. Considering education, 8(26.67%) of them were graduates and above and only 1 (3.33%) had no formal education in the experimental group. Correspondingly in the control group 8(26.67%) of them had completed graduation and above and 1 (3.33%) had no formal education. When considering the occupation, 7(23.33%) of them were unemployed and only 1(3.33%) were unskilled workers in the experimental group. Likewise in the control group 8(26.67%) of them were unemployed and 1(3.33%) were semi-skilled workers.With regard to monthly income of the family, in the experimental group, 11(36.67%) of them had an income of Rs.7878 to Rs.11,816 and (0%) none of them had an income below Rs.4726. In the control group, 11(36.67%) of them had an income of Rs.11,817 to Rs.15,753 and none of them had an income below Rs.1589. With regard to marital status,

in the experimental group 25 (83.33%) of them were married and in the control group, 23(76.67%) were married.

The study findings revealed that majority of the samples were males,married between the age group of 51-60 years with graduate and above qualification most of them were unemployed or retired. And therincome between Rs.7878-11816. The demographic variables revealed that there is no significant difference between the experimental and control group. The chi-square test also revealed that there was no statistical significance between the experimental and control group in relation to the demographic variables which revealed the homogeneity of the samples.

The first objective was to assess the post-test level of ICU psychosis among the cardiac post-operative patients in experimental and control group.

When taking into account the post-test I and post-test II level of ICU psychosis in the experimental group,the study findings showed that post-test I of ICU psychosis revealed that 9(30%) had normal and 20(66.67%) had sub-syndromal delirium and 1(3.33%) had delirium. The mean score of post-test I level of ICU psychosis was found to be 1.20 with S.D of 1.09. The post-test II findings revealed that 16(53.33%) had normal and 14(46.67%) had sub-syndromal delirium and none of them had delirium and the mean score of post-test II level of ICU psychosis was found to be 0.63 with S.D of 0.81.

The samples of the experimental group experienced reduced level of ICU psychosis. The findings revealed that modified ABCD bundle had an impact on reducing the level of ICU psychosis of the cardiac post-operative patients of the experimental group.

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Considering the post-test I and post-test II level of ICU psychosis in the control group, the findings revealed that 1(3.3 %) had normal and 17(56.67%) had sub-syndromal delirium and 12(40%) had delirium. The mean score of post-test I was found to be 3.23 with S.D of 1.67. The post-test II levels of ICU psychosis revealed that 4(13.33%) had normal and 12(40.0%) had sub-syndromal delirium and 14(46.67%) of them had delirium and the mean was found to be 3.06 with S.D of 1.74. The findings indicated that the number of patients with ICU psychosis increased from post-test I to

post-test II. The findings indicated that the hospital routine care does not have a beneficial effect on the level of ICU psychosis of the patients, among cardiac post-operative patients.

The post-test I findings indicated that samples from both the experimental and control group experienced ICU psychosis but there was significant difference between both of them showcasing the effect of modified ABCD bundle. In the post-test II the level of ICU psychosis had comparatively reduced in both the experimental and control group, but a significant difference was noted between the experimental group and the control group, indicating sustained effect of the modified ABCD bundle on the level of ICU psychosis.

The results of the study was consistent with the study findings of **Kanova M (2017)** conducted a prospective observational study to identify the prevalence and risk factors for ICU psychosis in ICU patients. The study was conducted for a period of 12 months in a 6 bedded ICU department of university hospital, Ostrava. ICU patients were assessed by using confusion assessment method. The study findings showed that incidence of ICU psychosis was 26.1% and also identified the risk factors which were, age above 65 years males, history of alcohol abuse. ICU psychosis showed greater need for ventilator support and increased ICU stay.

The second objective was to assess the effectiveness of modified ABCD bundle on level of ICU psychosis among cardiac post-operative patients in the experimental and control group.

Regarding the comparison of experimental and control group in the post-test I revealed that, the mean score was 1.20 with the SD of 1.09 in the experimental group and in the control group the mean score was 3.23 with the SD of 1.67. The students unpaired 't' test value **t=5.565** revealed that there ishigh statisticalsignificance between the experimental group and control group in post-test I **at p<0.001** level which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis among the cardiac post-operative patients.

Regarding the comparison of experimental and control group in the post-test II revealed that, the mean score was 0.63 with the SD of 0.81 in the experimental group and in the control group the mean score was 3.06 with the SD of 1.74. The students unpaired 't' test **t = 6.944** also revealed that there is high statisticalsignificancebetween the experimental group and control group in post-test II **at p<0.001** level which proved that modified ABCD bundle had sustained significant impact on level of ICU psychosis among the cardiac post-operative patients.

The paired 't' test revealed that there is statistically significant difference between the post-test I and post-test II in the experimental group with **t = 2.984 at p<0.01** level which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis among the cardiac post-operative patients. The paired 't' test revealed that there is no statistically significant difference between the post-test I and post-test II in the control group with t= 0.530 at p >0.01.

The study findings revealed that modified ABCD bundle had immediate and sustained effect on reducing the level of ICU psychosis among the cardiac post-operative patients.

Therefore, the hypothesis NH_1 which was stated earlier that **"There is no significant difference in the post-test level of ICU psychosis among the cardiac post-operative patients between the experimental and control group at p<0.05"**was not accepted.

Kram S L et al [2015] conducted an evidence based practice project to implement the ABCDE bundle on ICU psychosis. The study conducted in a six bedded adult intensive care unit of a rural community hospital. The study showed that implementation of ABCDE bundle decreased the hospital length of stay by 1.8 days, and base line delirium prevalence was only 19% over a 3 month time period. The study results revealed that the implementation of ABCDE bundle decreased the prevalence of ICU psychosis and decreased health care cost. This results is a strong evidence that ABCDE bundle can be effective for ICU psychosis and even it can be implemented in rural community hospitals and it was a cost effective method to reduce the level of ICU psychosis.

The third objective was to associate the post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

The association findings of the experimental group revealed that a statistically significant association was found between the post-test I level of ICU psychosis and the demographic variable, gender **(χ^2= 7.933 at p<0.05**) and marital status (χ^2 **=32.160 at p <0.001**) and there is no statistically significant association found between the post-test I level of ICU psychosis and the other demographic variables such as age, educational status, occupation and monthly family income.

The association of post-test I level of ICU psychosis with selected demographic variables of the control group revealed that a statistically significant association was found between the post-test I level of ICU psychosis and the demographic variable, occupation (χ^2**= 25.460 at p <0.05**) and there was no statistical significant association found between the post-test I levels of ICU psychosis and the other demographic variables such as age, gender, educational status, monthly family income and marital status.

Hence the hypothesis NH_2 which stated earlier that **"There is no significant association of level of ICU psychosis with selected demographic variables of experimental group at p<0.05"** was not accepted for the demographic variable gender, marital status and occupation. It was accepted for other demographic variables.

SUMMARY,

CONCLUSION,

IMPLICATION,

RECOMMENDATION

AND LIMITATION

CHAPTER – 6

SUMMARY, CONCLUSION, IMPLICATION, RECOMMENDATION AND LIMITATION

The present study was aimed to assess the effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients. This chapter deals with summary, conclusion, implication, recommendation and limitation.

6.1 SUMMARY

Patients who underwent cardiac surgeries have ICU psychosis due to unfamiliar environment and pain. ICU psychosis induces certain complications after surgeries and also affects many physiological parameters such as heart rate, and blood pressure thereby causing severe discomfort to the patient. Throughout its history, the mission of nursing care was focused on the psychological care along with the physical care to relieve it. Hence the investigator undertook the present study to assess the effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients at selected hospital setting in Chennai.

The objectives of the study were

1. To assess the post-test level of ICU psychosis among the cardiac post-operative patients in the experimental and control group.
2. To assess the effectiveness of modified ABCD bundle on level of ICU psychosis among cardiac post-operative patients in the experimental and control group.
3. To associate the post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

The study was based on the assumptions that

1. Cardiac post-operative patients are at risk of developing ICU psychosis.
2. Cardiac post-operative patients need additional interventions for the prevention of ICU psychosis.
3. Modified ABCD bundle are potential solution for preventing ICU psychosis

The Null hypotheses formulated were

NH_1: There is no significant difference in the post-test level of ICU psychosis among cardiac post-operative patients in the experimental and control group.

NH_2: There is no significant association of post-test level of ICU psychosis among cardiac post-operative patients with their selected demographic variables of experimental and control group.

The broad review of related literature, professional experience and expert's guidance which provided the strong foundation for the study including the basis for the conceptual framework and formation of the tool.

The conceptual framework for this study was developed based on Wiedenbach's Helping art of clinical nursing theory, which provided the comprehensive framework for evaluating the effectiveness of modified ABCD bundle.

The research methodology of the study was:

The research design used in this study was true experimental post-test only design and it was conducted in adult intensive care unit and various cardiac wards of Madras Medical Mission Hospital, Chennai. The areas were allocated to both experimental and control group using simple random technique (lottery method). Samples were selected based on sample selection criteria. Informed consent was obtained from each individual who was selected for the study.During the pre-operative period, demographic data was collected and ABCD bundle component of "Awakening" was started along with hospital routine care. During the 1stpost-operative day awakening component was again reinforced. Immediately after the extubation the other components of ABCD bundle were initiated and continued till 4thpost-operative day.The post-test I and II level of ICU psychosis was assessed using the intensive care delirium screening check list. The patients in the control group were administered the hospital routine care. The collected data were tabulated for analysis.

The major findings of the study were:

In the post-test I level of ICU psychosis in the experimental group had a mean score of 1.20 with SD of 1.09. Whereas the control group had the mean score of 3.23 with SD of 1.67. With regard to the post-test II level of ICU psychosis, the mean score

was 0.63 with SD of 0.81 in the experimental group and in the control group the mean score was 3.06 with SD of 1.74.

The students unpaired 't' test revealed that there is statistically highly significant difference between the experimental group and control group in post-test I **(t = 5.565 at p<0.001)** which proved that modified ABCD bundle had significant impact on reducing the level of ICU psychosis among the cardiac post-operative patients.

There is a high statisticalsignificancebetween the experimental group and control group in post-test II level of ICU psychosis using the student unpaired 't' test which **(t = 6.944 at p<0.001)** proved that modified ABCD bundle had sustained, and significant impact on level of ICU psychosis among the cardiac post-operative patients.

The paired 't' test revealed that there is high level of statistical significance between the post-test I and post-test II level of ICU psychosis in the experimental group with **t = 2.984** which was found to be higher than the table value **at p<0.001** which proved that the significant impact on reducing the level of ICU psychosis among cardiac post-operative patients.

The study findings revealed that modified ABCD bundle had immediate and sustained effect on reducing the level of ICU psychosis among the cardiac post-operative patients.

The findings also revealed that a statistically significant association was found between the post-test I level of ICU psychosis among experimental group and the gender **(χ^2=7.933 at p<0.05)** and marital status **(χ^2=32.160 at p<0.001).** The post I level of ICU psychosis among control group and the occupation **(χ^2 =25.460 at p<0.05).** The findings indicated that the samples in male gender married population and skilled workers are having sub-syndromal delirium.

6.2 CONCLUSION

This study assessed the effectiveness of modified ABCD bundle on level of ICU psychosis among cardiac post-operative patients at a selected hospital setting, Chennai.

The findings concluded that modified ABCD bundle was very effective in reducing the level of ICU psychosis among cardiac post-operative patients and can be used as a non-pharmacological measure during the ICU stay for patients.

6.3 IMPLICATION

Nursing Practice

The modified ABCD bundle is a simple, economical and efficient multi component intervention that can be easily incorporated to the parent hospital (MMM).

By orienting the client about the ICU stay in the outpatient department and cardiac ward will make the intervention given during the post-operative period more comfortable. ABCD bundle can be used in the ICU during the post-operative period to reduce the level of ICU psychosis.

Nursing Education

Nurse educators can educate the students and trainee nurses about the various pharmacological and non-pharmacological interventions to relieve ICU psychosis in the patients.

Nurse educator can arrange and conduct workshops, conferences and seminars on monitoring and management of ICU psychosis management and highlight the effectiveness of simple, inexpensive and easily available interventions like the modified ABCD bundle which can effectively reduce ICU psychosis in the patient.

Nursing Administration

Nurses are often overworked and understaffed. Creation of a specialized post of nurse counsellor and educator who would exclusively educate the patient using a modified ABCD bundle approach would elevate the standard of nursing care.

Nurse administrator ensures the implementation of nursing interventions which are research based and clinically effective in promoting the comfort of the patient.

Nursing Research

Nurse researcher can encourage clinical nurses to apply the research findings in their daily nursing care activities and can bring out new innovative techniques used to promote comfort of the patient during ICU stay. Nurse researcher can promote research with regard to utilization of pharmacologic and non-pharmacological agents to relieve ICU psychosis in clinical practice.

Dissemination of the findings through conferences, professional journals will make the application of research findings to be effective.

6.4 RECOMMENDATIONS

Based on the study findings, the recommendations are,

1. The researcher has recommended the use of modified ABCD bundle on ICU psychosis among cardiac post-operative patients at The Madras Medical Mission hospital.
2. The study can be conducted for a larger group in different setting for better generalisation of the findings.
3. The intensive care delirium screening checklist could be incorporated in the hospital for assessing the level of ICU psychosis among the ICU patients.
4. Effectiveness of other non-pharmacological interventions, spontaneous awakening trial and spontaneous breathing trial in ICU psychosis could be studied.
5. A comparative study can be done to assess the effectiveness of modified ABCD bundle with other non-pharmacological interventions.

6.5 LIMITATIONS

1. The study was limited to one centre, it could be performed in other setting.
2. The investigator faced difficulty in collecting the related literature as there were limited studies on the effectiveness of ABCD bundle and other interventions in reducing level of ICU psychosis.
3. The study was conducted only among cardiac post-operative patients admitted in the cardiac intensive care unit. Patients undergoing other cardiac interventions and staying in cardiac intensive care unit could be included in further studies.

6.6 COMMUNICATION OF FINDINGS

The researcher is planning to communicate the findings either by a paper presentation or to publish the findings in an indexed journal so that the results can be generalized and utilized by all staff nurses working in the cardiac intensive care units and cardiac wards.

6.7 UTILIZATION OF THE RESEARCH FINDINGS

The findings will be utilized in the cardiac wards and cardiac Intensive care unit of The Madras Medical Mission hospital after the approval of the thesis. Modified ABCD bundle can be applied in the cardiac post-operative intensive care unit. The researcher feels that the modified ABCD bundle will help in reducing the ICU psychosis for cardiac post-operative patients and hence it helps to improve post-operative patient outcome and reduces the level of ICU psychosis.

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APPENDICES

MMM COLLEGE
OF NURSING
Learn to Serve
A Unit of
The Madars Medical Mission

APPENDIX – A

To

Dr.S.Rajan

Directo -Cardio Thoracic Surgery

Institute of Cardio-vascular Diseases

Madras Medical Mission

Chennai-37

Respected Sir,

Greetings from MMM college of Nursing!

Sub: Requesting for permission to conduct study among cardiac post-operative patients.,

This is to your kind notice that Ms.Nijin Samuel, is a bonafide student of MMM College of Nursing and currently undergoing MSc.(N) in the branch of Medical Surgical Nursing . As a part of her curriculum, she needs to conduct a study in the department of cardiology for her dissertation. I kindly request you to permit her to conduct the study on **"Effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients".** I assure that her study will not provide any risk to study subjects and she will be abide to the rules and regulations of the hospital activities will not be affected.

The same was presented before the ethical committee of the MMM Hospital. Kindly permit her to do the pilot study and main study.

Kindly do the needful.

Thanking You

30/1/16

PROF. Dr. ROSALINE RACHEL, M.Sc., (N), Ph.D.(N)
PRINCIPAL
MMM COLLEGE OF NURSING
No.131, SAKTHI NAGAR
NOLAMBUR, CHENNAI - 600 095.

THE MADRAS MEDICAL MISSION * INSTITUTE OF CARDIO-VASCULAR DISEASES * MOGAPPAIR, CHENNAI-600 037

Approved for conducting the studies

DR. S. RAJAN

Dr. S. Rajan
Director - Cardiac Surgery
Institute of Cardio - Vascular Diseases
Madras Medical Mission
Chennai - 600 037.

INSTITUTIONAL ETHICS COMMITTEE
THE MADRAS MEDICAL MISSION
No. 4-A, Dr. J.J. NAGAR, MOGAPPAIR, CHENNAI - 600 037, INDIA
Call : + 91 - 44 - 26561801, 26565961, 26565991 Fax : 91 - 44 - 26565859
E-mail : icvddoctors@mmm.org.in Website : http://www.mmm.org.in

To,

Date: 27 Jun 2016

Dr.V.M. Kurian,
Member Secretary,
Institutional Ethics Committee,
Madras Medical Mission,
Chennai

Sub: Submission of document to EC for review and approval.

Ref: An experimental study to assess the effectiveness of modified ABCD Bundle on ICU psychosis among cardiac post operative patients at MMM Hospital, Chennai.

Dear Dr.V.M. Kurian,

Please find along with this letter 6+1 copies of the following document with reference to the above mentioned study.

1. Protocol
2. Informed Consent Form
3. Assessment tool

I look forward to a favorable reply from the committee in the upcoming EC meeting. Kindly revert in case of any queries.

Thanks and regards,

Yours sincerely,

Ms. Nijin Samuel
MMM College of Health Science

Acknowledgment of Receipt	
Received by: (Signature and Stamp)	**Date:** 27/Jun/2016

Dr.V.M. KURIAN
Member Secretary
Institutional Ethics Committee
The Madras Medical Mission
No. 4-A, J.J. Nagar, Mogappair,
Chennai - 600 037.

INSTITUTIONAL ETHICS COMMITTEE
THE MADRAS MEDICAL MISSION
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E-mail : icvddoctors@mmm.org.in Website : http://www.mmm.org.in

To

Date: 27 Jul 2016

Ms. Nijin Samuel
MMM College of Nursing
Madras Medical Mission,
Chennai 600037

EC Reg no: ECR/140/Inst/TN/2013

Ref: An experimental study to assess the effectiveness of modified ABCD Bundle on ICU psychosis among cardiac post operative patients at MMM Hospital, Chennai.

Sub: Ethics Committee approval of study document for the above mentioned study.

Ms. Nijin Samuel

We have received from you 06+1 copies of each of following study related document submitted vide letter dated: 27 Jun 2016

1. Protocol
2. Informed Consent Form
3. Tools

At the Ethics Committee meeting held on 09 Jul 2016 your referenced letter and the above documents were examined and discussed. After due consideration, the committee has decided to approve the above-mentioned study.
The following members were present at the meeting held on 09 Jul 2016 at 9-30 AM – 11:30AM at Mount Tabour Lounge, Madras Medical Mission.

Name & Qualification	Primary Scientific or Non scientific Specialty	Affiliation with the institution	Gender
Dr. M.S. Ramachandran, MBBS,MD,FRCP,FICP,DSC(HONS), Prof.Director medicine(Rtd)	Chairperson	No	M
Dr V M Kurian, MS, MCh, DPMR. Sr. Consultant cardiovascular Surgeon Madras Medical Mission	Member secretary	Yes	M
Rev.Fr. Ninan Chacko, MA,DPS, Chaplain Theologist, ICVD, Madras Medical Mission	Non-Clinical Member Theologist/Layperson	Yes	M
Dr Ajit Mullasari, MD DNB DM, Director of	Member Clinician	Yes	M

cardiology, Madras Medical Mission			
Dr J. Ezhilan, MD, DM , DNB, FNB., Sr. Consultant cardiovascular Cardiologist Madras Medical Mission	Member, Clinician	Yes	M
Dr. Suma Malini Victor, MBBS, DNB., Consultant Cardiologist, Madras Medical Mission	Member, Clinician	Yes	F
Dr. Chitrasree V, MBBS,DCP Coordinator, Consultant Lab services, Madras Medical Mission	Member, Basic Medical Scientist	Yes	F
Mr. Ravi Kumar Paul, LLB Paul & Paul B.A., B.L., Advocates Chennai.	Member Legal Expert	No	M
Dr. C.B Tharani, M.D. Pharmacology	Pharmacologist	No	F
Mrs. Dhavaselvi Rajan , B.sc – Home science	Member, Lay person	No	F

The Committee expects from the Principal Investigator to report the clinical study on annual basis.

It was to be noted that neither you nor any of your proposed study team members were present during the decision-making procedures of the Ethics Committee.

Yours truly,

Signature: _____ **Date:** 27 | July | 2016

Name: Dr V M Kurian
Title: Member secretary

Dr.V.M. KURIAN
Member Secretary
Institutional Ethics Committee
The Madras Medical Mission
No. 4-A, J.J. Nagar, Mogappair,
Chennai - 600 037.

APPENDIX – C

PATIENT CONSENT FORM

Respected Sir/ Madam,

I am pursuing my M.sc in Nursing at MMM College of Nursing, Chennai, for which I am doing research on effectiveness of modified ABCD bundle on ICU psychosis among post-operative cardiac patients. I kindly request you to participate and provide the baseline information about you.

I expect your co-operation for the interventions after your cardiac surgery. I assure you that the details provided by you will be used for my research only and will be kept confidential.

The participation is not compulsory and you can withdraw from the study at any time.

You can clarify any queries related to this.

I also assure that the intervention provided will not harm you at any cost.

Nijin Samuel,
M.Sc Nursing Student
MMM College of Nursing

I would like to participate in the study.

Signature of the Participant:

Date:

APPENDIX – D

TOOL FOR DATA COLLECTION

SECTION A: ASSESSMENT TOOL

SAMPLE NUMBER:

PART 1- DEMOGRAPHIC VARIABLES

1. **1.Age of the patient in years**
    a. 20 – 30
    b. 31 – 40
    c. 41 – 50
    d. 51 – 60
    e. 61 – 70

2. **Gender**
    a. Male
    b. Female

3. **Educational status**
    a. illiterate
    b. Primary school
    c. Middle school
    d. High school
    e. Intermediate
    f. Graduate & above

4. **Occupation**
    a. Unemployed
    b. Unskilled worker
    c. Semi-skilled worker
    d. Skilled worker
    e. Clerical shop owner, Farmer
    f. Semi-Profession
    g. Profession

5. Monthly family income in Rs.

a. < 1589
b. 1590 – 4726
c. 4727 – 7877
d. 7878- 11,816
e. 11817-15753
f. 15,754-31,506
g. >31507

6. Marital status

a. Married
b. Unmarried
c. Separated
a) Widowed

PART II: INTENSIVE CARE DELIRIUM SCREENING CHECKLIST (ICDSC) TO ASSESS THE LEVEL OF ICU PSYCHOSIS

Sl.No.	Items	Yes	No
1.	Altered level of consciousness		
2.	Inattention		
3.	Disorientation		
4.	Hallucination, delusion, or psychosis		
5.	Psychomotor agitation or retardation		
6.	Inappropriate speech or mood		
7.	Sleep-wake cycle disturbance		
8.	Symptom fluctuation		

Scoring: Answer "Yes" carries 1 mark and "No" carries 0 mark.

TOTAL SCORE: _____ (0 – 8)

Score Classification

0 - Normal

1-3 - Sub-syndromal delirium

4-8 - Delirium

APPENDIX – E

SECTION B: INTERVENTION TOOL

Growing evidence suggests that there is an iatrogenic component to intensive care unit practice that influences post-operative patients. Likelihood of experiencing ICU psychosis. This co-morbidity is common in post-operative patients and it independently predicts increased mortality, mechanical ventilator days, ICU length of stay, and use of continuous sedation and physical restraints.

ABCDE bundle is a small set of evidence-based practices that have been proven to improve patient outcomes. ABCDE bundle is used in the ICU setting for managing ICU psychosis and pain. The use of the bundle was suggested in the 2013 clinical practice guidelines for the management of ICU psychosis, agitation, and pain in adult patients in the intensive care unit by American association of critical care nurses.

Modified ABCD bundle approach will improve patient outcomes and to which patients the bundle should be applied to cardiac post-operative patients to manage ICU psychosis. This study was designed to provide a better understanding of these important aspects of the modified ABCD bundle management strategy. The investigator's goal was to determine if implementing the modified ABCD components as a bundle would prove safe and effective and whether it should be applied to every cardiac post-operative patient on a daily basis in managing ICU psychosis.

Modified ABCD bundle is a group of interventions which were given to selected cardiac post-operative patient. Modified ABCD bundle consist of a group of interventions like awakening, breathing exercises, cognitive stimulating activities, and daily exercises which were designed by the investigator to be administered from the pre-operative period till 4th post-operative day for preventing the development of ICU psychosis.

The four distinct components of the modified ABCD bundle are,

1. Awakening
2. Breathing exercises
3. Cognitive stimulating activities
4. Daily exercises

Awakening (Pre-operative period)

A pre-operative period intervention starts a day before surgery.

The patient was explained regarding the following topics

ICU –setup:

- After the surgery the patient will be transferred to the intensive care unit.
- The ICU will have monitors, infusion pumps, various tubings and other equipment.
- The patient will be explained that he/she will be on a ventilator and the need to stay calm.
- The room will be cold and he/she will be kept warm with the help of a blanket /warmer.
- The patient is also explained the he/she would be on a ventilator and will not be given any oral feeds.
- Adequate explanation is given regarding post surgical pain and hallucination.
- The patient is explained that there may be a chance of disorientation with regard to time due to the a lack of natural light.

ICU –team:

- With regard to ICU team, typically on ICU team consists of surgeons, anesthetist, intensivist, nurses and ward assistants.
- Each patient would be assigned to one staff who will take care of the patient for a period of 6-12 hours.
- All the team members will be in a blue attire (sterile scrub) with mask and cap.

ICU-policies and rules:

- Certain policies and rules regarding ICU are explained to the patient.
- Visiting hours are restricted to 2 hours (5pm-7pm).
- The visitors are advised to use handrub to disinfect themselves.
- The availability of intercom will be provided.
- Patients are not allowed to wearing their own gown.
- Fresh flowers and fruits are prohibited.

Stages of recovery:

The patient was explained regarding the stages of recovery. The stages were explained according to the days of admission to the ICU. The following points were discussed.

Day 1: Transfer to OT after surgery

Presence of ET tube, NG tube, urinary catheter and ventilator.

Connected to various cardiac monitors and infusion pumps.

Day 2: Removal of chest drains, ET tube, followed by chest physiotherapy and initiation of oral feeds.

Day 3: Ambulating the patient from bed to chair.

Initiation of small walks.

Day 4: Depending on the severity of the patient's condition he/she will be transferred from thee ward on the 4^{th} or 5^{th} day.

Post-operative period

Post-operative period "Awakening" is started when the patient is weaned of from sedation and able to respond.

Post-operative orientation about

- Time: The patient is oriented to time with the help of a wall clock and watch. The patient was also encouraged to look out of the window.
- Place : The patient is oriented to place
- Person: The patient is oriented that his surgery got over and now he is in the ICU
- Things: The patient is oriented about ventilator, cardiac monitor and other tubings.

Breathing exercises

Second component of modified ABCD bundle is breathing exercises, which starts immediately after the extubation from 2^{nd} post-operative day and continued till to 4^{th}post-operative day.

- Oxygen therapy
- Deep breathing exercises
  - **Pursed lip breathing (5min):** The investigator assists the patient to inhale through nose and hold it for a count of one. Pursed lips are as if were going to

blow a whistle and breathe out slowly for a count of two. Patient is advised not to blow the air out but to let it escape on its own. It helps to release trapped air in lungs.

- **Abdomen breathing (5min)**: The investigator assists the patient to lie on his back with a pillow under his knees. Patient is asked to place one hand on his upper chest, the other on his stomach just below the rib cage and asked to inhale slowly through nose until he feels the stomach pushing against his hand while ensuring that the chest does not move. The patient was advised to tighten his stomach muscles and exhale slowly through the mouth while counting up to six. Based on patient's capabilitythe exercise was repeated up to five times.
- **Chest breathing (5min):** The investigator advises the patient to lie down and place one hand on each side of his ribs and to breathe in deeply through the nose. He was advised to hold his breath for three seconds and then breathe out through the mouth with pursed lips. The exercise is repeated five times. This helps to reduce the risk of lung complications after surgery.
- **Incentive spirometer exercise (10min):** An incentive spirometer is a breathing device that measures how well the patients were able to breathe deeply. To use the device, the investigator assisted the patient to sit and place his lips tightly around the mouthpiece of the spirometer and was advised to breathe in slowly and deeply. The yellow ball in the clear tube portion of the device rise towards the top of the tube after that he is advised to hold his breath as long as possible before exhaling. This helps to eliminate mucous and avoid serious infection or pneumonia after cardiac surgery.
- **Coughing:** The investigator assists the patient in sitting position and is asked to press a chest pillow against the surgical incision. The patient is encouraged to take 10 deep breaths and then cough twice. The exercise is repeated four times each day. It helps to remove mucous from lungs.

Cognitive stimulating activities:

Cognitive stimulating activities started from 2nd post-operative day to 4th post-operative day. Cognitive stimulating activity helped people cope up with situations, distress, ICU setup, current surgery trigger, undesirable actions and feelings. Cognitive stimulating activity is an effective form of treatment for ICU psychosis. Cognitive

stimulating activities includes, reading news paper, books and magazines, doing minor calculations Eg. 5+5 ,10-7= and word games.

Daily exercise:

Daily exercise starts from 2nd post-operative day to 4th post-operative day. Exercise and progressive mobility, all patients with prolonged bed rest or immobility are proned to developing muscle weakness and atrophy, which can lead to a longer hospital stay and long-term muscle dysfunction. This component provides guidance for enabling patients to become progressively more active and do minor exercises. Early mobility protocols are

- Passive range of motion 3 times a day,
- Turning every 2nd hourly,
- Sitting position for 20 min,
- Sitting on the edge of the bed,
- Active transfer to chair,
- Ambulation for 5 min.

APPENDIX – F

LETTER SEEKING EXPERTS OPINION AND SUGGESTION FOR THE CONTENT VALIDITY TOOL

FROM

Mrs.Nijin Samuel
1st Year M.Sc. Nursing
MMM College of Nursing
Mogappair West
Chennai – 60.

TO

_____
_____
_____

Forwarded Through

The Principal
MMM College of Nursing
Mogappair West
Chennai – 60.

Respected Sir\Madam,

Sub: Expert opinion for content validation of research tool.

I, Ms.Nijin Samuel, 1st year M Sc. Nursing student (medical and surgical nursing) of MMM College of Nursing, request your good self, if you could kindly accept to validate my research tool on topic "**Effectiveness of modified ABCD bundle on ICU psychosis among post-operative cardiac patients at a selected hospital, Chennai."**

I would be obliged if you would kindly affirm your acceptance to the undersigned with your valuable suggestion on this topic. I shall send details of my study along with the research tool.

Thanking you in anticipation.

Yours Sincerely

MS. NIJIN SAMUEL

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS:

1. **Dr.Rajan.S, MS.,Mch**
   Senior Cardio Vascular Surgeon,
   Dept of Cardio Thoracic Surgery.
   Madras Medical Mission Hospital
   Chennai.

2. **Dr.Anbarasu Mohanraj MS., DNB., Mch**
   Senior Cardio Vascular Surgeon,
   Dept of Cardio Thoracic Surgery.
   Madras Medical Mission Hospital.

3. **Dr.Kannakarajan .N MD.,PDCC**
   Senior Anesthetist,
   Dept of Cardio Thoracic Surgery,
   Madras Medical Mission Hospital.

4. **Dr.Dinesh MD.**
   Medical superintendent
   Madras Medical Mission Hospital,
   Chennai.

NURSING EXPERTS:

5. **Mrs.Annamma Jacob, MSc (N), M Phil**
   Associate Professor,
   JOSCO College of Nursing,
   Edappon, Pandalam, Kerala
   Kerala – 686 104.

6. **Mrs.Kavitha, MSc (N)**
   Associate professor
   MIOT College of Nursing,
   Chennai- 600089.

7. **Mrs.Rekha, MSc(N),**
   Associate Professor,
   JOSCO College of Nursing,
   Edappon, Pandalam, Kerala
   Kerala – 686 104.

CONTENT VALIDITY CERTIFICATE

This is to certify that Ms.Nijin Samuel, M.Sc. (Nursing) at MMM college of nursing, affiliated to The Tamil Nadu Dr.M.G.R Medical University whose data collection tool on the topic. **"Effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients at a selected hospital, Chennai"** is being validated by me and I have suggested the necessary changes to execute.

Signature of the expert

DR. S. RAJAN

DIRECTOR - CARDIAC SURGERY

Designation and address

Dr. S. RAJAN
M.S., M.Ch.
Reg. No. 33960

Place: Chennai

Date: 7. 7. 2016

THE MADRAS MEDICAL MISSION * CHENNAI-37 *

Dr. S. Rajan
Director - Cardiac Surgery
Institute of Cardio - Vascular Diseases
Madras Medical Mission
Chennai - 600 037.

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Signature of the expert

Designation and address

Dr. Anbarasu Mohanraj, MS.,DNB.,MCh.
Senior Consultant Cardiothoracic Surgeon
Madras Medical Mission, Chennai
Ph : +91 9840910535

Place: Chennai.

Date: 7/7/2016

THE MADRAS MEDICAL MISSION * INSTITUTE OF CARDIO-VASCULAR DISEASES * MOGAPPAIR, CHENNAI-600 037

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N. Kanagarajan

Signature of the expert

Dr. N. KANAGARAJAN
SENIOR CONSULTANT-ANAESTHESIA

Designation and address

Place: Chennai

Date: 10/7/2016

THE MADRAS MEDICAL MISSION
CHENNAI-37

CONTENT VALIDITY CERTIFICATE

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Signature of the expert

Place: CHENNAI

Date: 08.07.2016

Designation and address

Dr. M. DINESH KUMAR, MBBS, MD
Registration No: 65230 (TN Medical Council)
Medical Superintendent
The Madras Medical Mission
No. 4A, Dr. J.J. Nagar, Mogappair East,
Chennai-600 037.

CONTENT VALIDITY CERTIFICATE

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Annamma Jacob

Signature of ~~the expert~~ 28/8/2016.

Place: KUCANADA

Date: 28/8/2016.

JOSCO COLLEGE OF NURSING EDAPPON JOSCO JN PANDALAM

Designation and address

ANNAMMA JACOB M.Sc (N)
M. Phil.
ASSOCIATE PROFESSOR.
DEPT. OF MED SURG. NSG
JOSCO COLLEGE OF NSG
EDAPPON, PANDALAM.
KERALA STATE.

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Signature of the expert

Associate professor
MIOT College of Nursing
Chennai-89.

Designation and address

Place: Chennai

Date: 15/7/16

CONTENT VALIDITY CERTIFICATE

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Signature of the expert

Place: PANDALAM

Date: 27/8/2016

Designation and address

Mrs. REKHA. S.
Asso. PROFESSOR
Josco COLLEGE OF NURSING,
EDAPPON,
PANDALAM

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the study executed by Ms. Nijin Samuel who is pursuing M.Sc. Nursing II year at MMM college of Nursing, Chennai 91, affiliated to The Tamil Nadu DR. M.G.R. Medical University; Chennai on the topic **"Effectiveness of modified ABCD bundle on ICU psychosis among cardiac post-operative patients"** is edited for English language appropriateness by MRS. SABIKALA FERNANDO M.A BEd The words used in this study were edited by me and were found to be correct and appropriate.

Signature with Seal

EXCEL ABROAD
No. 45, A Block, 3rd Avenue,
Anna Nagar, Chennai-600 102.

APPENDIX – H

PLAGIARISM REPORT

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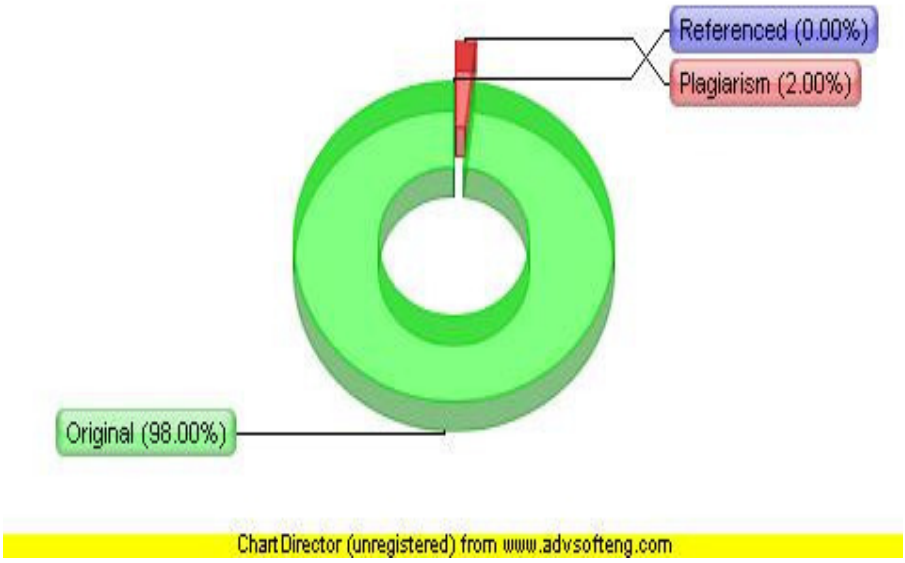

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